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Using Direct Metal in Foundry

*Blast Furnace Iron and Cupola Iron Mixed in Ford Plant to
Obtain Desired Analysis—Electric Furnace
Controls Temperature*

MOLTEN iron from the blast furnace, mixed with cupola metal, is used in pouring molds under a direct-metal process now being successfully operated by the Ford Motor Co. in making automobile cylinder blocks in its gray iron foundry at its Fordson plant at Fordson, Mich. The blast furnace metal is being used in a proportion 50 to 60 per cent of the total mixture, the remainder being cupola metal.

Under the process as employed, the blast furnace metal and the cupola metal are combined in a hot-metal mixer similar to that used in open-hearth steel plants. From the mixer the metal goes through the electric furnaces for the purpose of bringing it up to the proper temperature for pouring. From the standpoint of finished product, it is stated, the process is working out with marked success, in that the silicon is more closely controlled than in the ordinary cupola operation and that the castings are of more uniform quality.

To carry out the direct-metal process the company erected two new cupolas, a 400-ton hot metal mixer and two 15-ton electric furnaces, and provided cranes and other hot-metal handling equipment. A mixer building and an adjoining building for the new cupolas were

erected at the side of the foundry cupola building.

Blast furnace iron used in the process is tapped in an 80-ton ladle on which it is taken on a ladle car through the pig casting department, where it is weighed. Thence it goes to the mixer. The weight is stamped on a ticket which accompanies the hot metal to the mixer room. This room is served by a 125-ton ladle crane which handles both the blast furnace and cupola metal.

Unusual because of their size, the cupolas, of standard design, have 120-in. shells lined down to 96 in. They are said to be as large as any ever built, if indeed not the largest. They are 120 ft. high from the top to the base, being made unusually high so that there is little danger that gases from the stacks, when discharged into the atmosphere, will be carried down into the other manufacturing buildings. Unusually large cupolas are provided so that as large an amount of iron as possible can be melted in the cupola in a short time. Up to 25 tons of iron is taken from the cupola each time it is tapped.

As approximately 75 tons of iron is brought from the blast furnace at a time, it is desirable to tap at least an equal amount of iron from the cupola in a short time, so that the hot metal from the two sources can be charged into the mixer before the blast furnace metal has time to cool off in its ladle. In loading the mixer a ladle of 25 tons of cupola iron, which has the

In the Manufacture of Automobile Cylinder Blocks by the Direct-Metal Process, the First Step Is Tapping the Blast Furnace Iron into 80-Ton Ladles, in Which It Is Taken to the Hot-Metal Mixer Building (Top of Page)



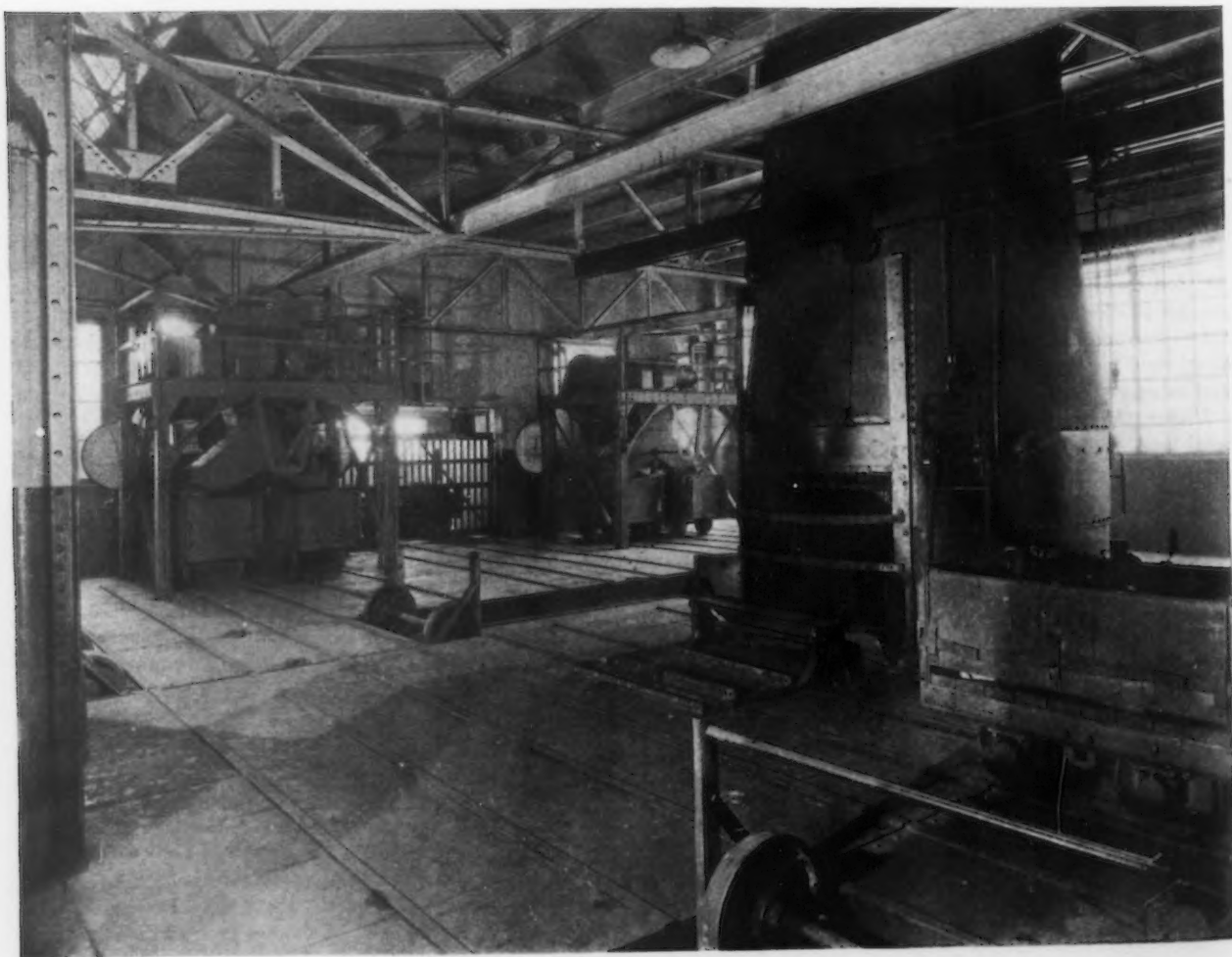
(Above) Weighing Ladle of Hot Metal on Its Way from the Blast Furnace to the Hot-Metal Mixer

(Below) Conveyors Deliver Scrap from the Foundry to This Cupola-Charging Floor. From the conveyors it passes through hoppers to 1-ton charging cars, which are dumped mechanically into the cupola

higher temperature, is put in first, then blast furnace metal and then more cupola metal. The cupola iron is poured into the mixer at a temperature of about 2500 deg. and the blast furnace iron at from 2100 deg. to 2200 deg.

The mixer is filled during the night with sufficient metal to supply the 8-hr. day shift in the foundry. The cupola starts melting at midnight and is tapped four times between that hour and 4:30 or 5:00 a. m. Then the mixer is completely filled, provided that the maximum of iron that it will handle is required for the day's foundry run. The cupola charge weighs 4000 lb. as compared with the usual 2400-lb. charge. This charge is made up of 2800 lb. of scrap from the foundry, consisting of scrapped cylinders and sprues, and 1200 lb. of low-carbon open-hearth steel scrap. The charge is the same as used in the cupolas when the usual foundry melting methods are followed. The two cupolas are used on alternate nights.

The bottoms of the cupolas are built higher than usual, bringing the spouts approximately 12 ft. above the floor, to permit pouring into the 25-ton ladle, which is mounted on an electrically operated ladle car. This car runs on a short section of straight track that extends from the front of the cupola to the hot-metal mixer room, where the ladle crane charges its iron into the mixer. Scales are located in the track for weighing the cupola metal.



As the mixer contains metal for a day's run, part of the metal remains in it from soon after midnight, when the first ladle is poured in from the cupola, until the mixer is emptied well along in the afternoon. The mixer is equipped with oil burners for maintaining the temperature of the metal and it is stated that the temperature will not drop over 5 deg. in 24 hr.

Two electric furnaces, acid lined and of 15-ton capacity, are used, as previously stated, only for bringing the metal up to the proper heat for pouring. They have 14-in. graphite electrodes. These are larger than are usually used, being designed to get a large amount of heat quickly so that the metal does not have to remain long in the furnace. The furnace is charged from the back through a long pouring spout, the usual side charging doors being eliminated. A screw mechanism tips the furnace forward for tapping.

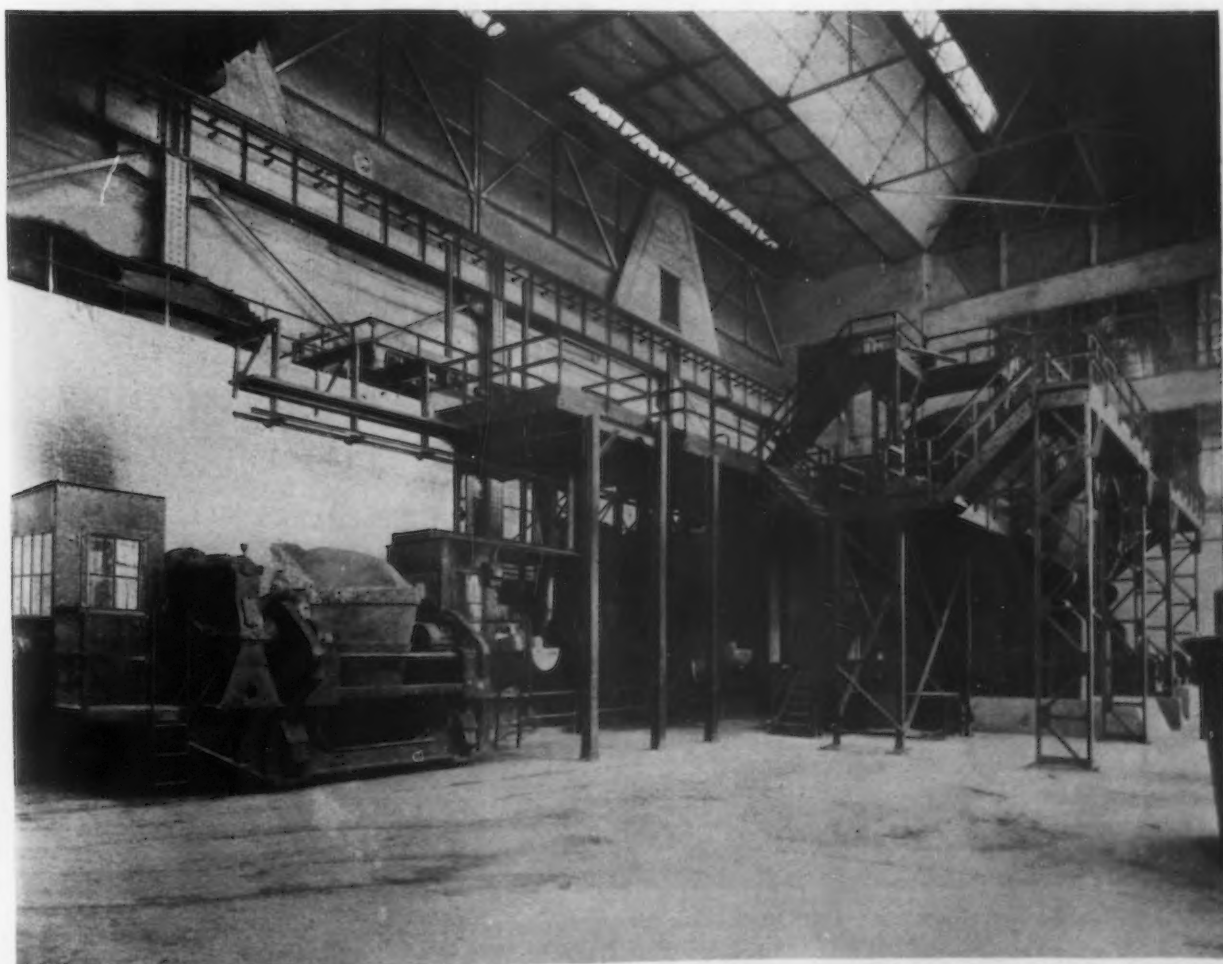
Metal from the mixer is discharged into a 20-ton ladle mounted on an electrically operated transfer car. The ladle charge is 15 tons, or the capacity of the furnace. This ladle is of a special shape, so designed that the mixer can be drained and the metal poured into the electric furnace with the least spillage.

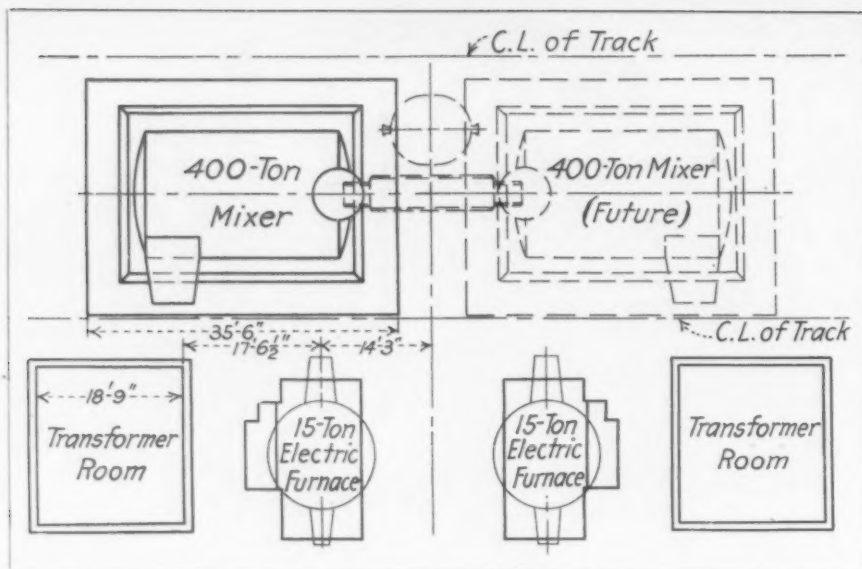
During the 20 to 24 min. the metal is kept in the electric furnace, it is brought from the temperature of 2200 deg., at which it leaves the mixer, to a pouring temperature of 2700 deg. The two furnaces are charged and



(Above) Cupola Metal That Is Mixed with the Blast Furnace Metal Is Melted in Two Very Large Cupolas and Is Tapped into a 25-ton Ladle Mounted on a Transfer Car

(Below) Hot-Metal Transfer or Mixer Room. At left is the 15-ton transfer car which handles metal from mixer to electric furnaces. The picture shows, in center, the long rear spouts of the two electric furnaces, through which the metal is poured into the furnaces. The cupola room is directly back of the wall at extreme right, beyond the mixer





Layout of Mixers and Electric Furnaces. The upper track brings in iron from the blast furnaces, which is dumped into the mixers. The track in middle transfers iron from the mixers, and from the cupolas (located just beyond left of drawing), to the electric furnaces for adjustment of temperature and silicon content

poured alternately. When one is being tapped the other is being loaded, and when the first is empty the second is ready for tapping. The furnaces are tapped into a 1500-lb. ladle, from which the molds are poured. Each furnace is equipped with a skimmer to hold the slag back and this is dumped at the end of the day's shift.

It is stated that the amount of iron produced in the foundry with the present direct process equipment is equal in amount to that made in ten of the regular foundry cupolas, which have 78-in. shells lined down to 60 in.

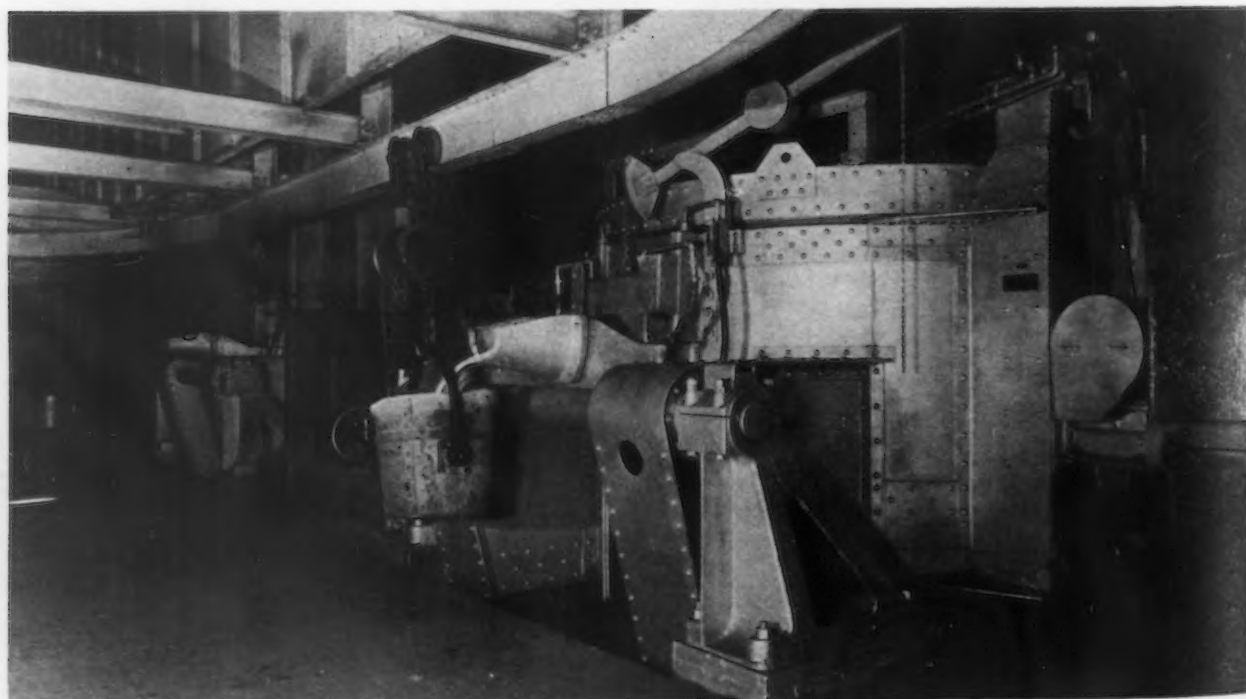
In its usual foundry practice the Ford company is using "canned" borings in its cupola, the borings being pressed into cylinders similar to sections of stove pipe. To avoid canning the borings and melting them in the cupola, experimental work has been conducted in pouring this scrap through a hopper into the spout of the electric furnace while the metal is being poured into the spout from the mixer ladle. Borings added, to the amount of 5 per cent of the total electric furnace charge, were almost immediately absorbed in the molten metal with hardly an appreciable loss in heat. While the tests have proved successful, this method of melting the borings is still in its experimental stage.

The silicon content of the iron is closely controlled by varying the proportions of the blast furnace and cupola metals. While the silicon content of the cupola iron is practically constant, that of the blast furnace iron is variable. Practice in the foundry calls for iron running 1.80 per cent in silicon. The method of making a mixture that will have the required and uniform silicon content is quite simple.

If the blast furnace metal is running high in silicon the percentage of cupola metal is increased. It is only a matter of percentage of each metal to secure a mixture that has the proper silicon content. Assuming that the cupola iron runs 0.90 per cent in silicon and the blast furnace iron has a 3.25 per cent silicon content, then 60 per cent of the former would provide 0.54 per cent silicon; 40 per cent of blast furnace iron would give 1.30 per cent silicon, and the mixture would have 1.84 per cent silicon content.

Most satisfactory results have been attained in the control of the metal. The variation of the silicon content is held within 10 points and some days it has been less than 5 points. In regular cupola operation there is a variation of from 15 to 20 points in the silicon

(Concluded on page 1928)



Front of the Electric Furnaces. Iron from these furnaces is tapped into 1500-lb. ladles suspended from an overhead trolley system. Molds are poured from these small ladles



Charles B. Dudley,
First President,
1902 to 1909

Testing Engineers Commemorate 25th Anniversary

*First Convention in Middle West
Hears of New Methods of Magnetic
Testing—Inhibition of Boiler Plate
Embrittlement Nearer—Conclusions
on Sulphur in Steel Plate—New De-
velopments in Fatigue*



Edgar Marburg,
Secretary, 1902
to 1918

CELEBRATING the twenty-fifth anniversary of its incorporation, and holding the first meeting away from the Atlantic seaboard since 1903, the American Society for Testing Materials assembled last week, June 20 to 24, in its thirtieth annual convention, at French Lick, Ind. The selection of a middle western location was somewhat of an experiment as well as a concession to western members.

The results were in the main satisfactory. The experiment has now been tried out, and it was decidedly demonstrated that the attendance from western members was not particularly augmented over that at sessions held in recent years at Atlantic City. The falling off was, of course, principally from New York and Pennsylvania.

The registered attendance last week was about 625 men, as compared with 905 at Atlantic City in June, 1926. With the exception of the joint international meeting at New York in 1912, the last convention away from Atlantic City and Asbury Park, N. J., was at Delaware Water Gap, Pa., in 1903.

The technical sessions were of the usual high order. Several contributions registered advances—in magnetic testing, in X-ray developments, in fatigue studies and in general research. The reports of standing committees, dealing with changes and additions to specifications, were of the usual importance and interest.

Silver Jubilee Celebrated at Anniversary Dinner

IN 1898 a group of men had visions of the benefits obtainable from a systematic method of testing various materials. They met on June 16 of that year and formed the American Section of what was then known as the International Association for Testing Materials.

How the Society Was Organized

IN 1902 seven men concluded that better results could be arrived at by forming an independent society. This movement resulted in the organization of the American Society for Testing Materials on April 12. The charter applied for at that time was accepted on June 12, 1902. The membership of the American sec-

tion in 1898 was 70; in 1902 this had grown to 175; today the society numbers 4220.

Recognition of the silver jubilee of the society took the form of an anniversary dinner. Nearly 600 members and guests assembled in the dining room of the French Lick Springs Hotel, the headquarters, on Wednesday evening, June 22. At the head table was Past-president W. H. Fulweiler, who acted as toastmaster, the three new honorary members or their representatives, the first Charles B. Dudley Medalist and several officers and members of the executive committee.

At tables immediately in front of the head table there were seated 18 of the 66 living members who have been affiliated with the society since 1902 and about 38



Members Affiliated With the Society for 25 Years and Present at Anniversary Dinner: In order, Left to Right: C. N. Forrest, Barber Asphalt Co., Philadelphia; H. V. Wille, Baldwin Locomotive Works, Philadelphia; G. H. Clamer, Ajax Metal Co., Philadelphia; H. E. Smith, New York Central Lines, New York; A. W. Dow, consulting engineer, Brooklyn; A. A. Stevenson, Standard Steel Works Co., Philadelphia; R. S. MacPherran, Allis Chalmers Mfg. Co., Milwaukee; J. A. Capp, General Electric Co., Schenectady; T. D. Lynch, Westinghouse Electric & Mfg. Co., Pittsburgh; S. T. Wagner, Reading Railroad, Philadelphia; J. J. Shuman, Jones & Laughlin Steel Corporation, Pittsburgh; A. N. Talbot, University of Illinois, Urbana; A. H. Sabin, National Lead Co., New York; R. L. Humphrey, consulting engineer, Philadelphia. Others present, not in picture: E. C. Holton, Sherwin Williams Co., Cleveland; W. K. Hatt, Purdue University, Lafayette, Ind.; G. E. Thackray, Bethlehem Steel Co., Bethlehem, Pa.; Walter Wood, R. D. Wood & Co., Philadelphia

President Gibboney's Anniversary Address

"The Twenty-fifth Anniversary"

EVERY anniversary is a significant occasion in the life of an organization. It is a time to turn back the years, so to speak, and by reexamination get a perspective view of our successes and our failures. We may justly take pride in our successes and, if we are wise, we may find profit in our failures.

The twenty-fifth anniversary in the life of our organization is an especially important one, for it seems that through the years our plans and purposes have withstood the test of time, and by duties well done we have proved the right to live and to grow as a helpful part of our industrial life.

As an individual, so an organization grows old, and some exceed their three score years and ten, their usefulness increasing with the years so long as they inspire in each succeeding generation hopes and aspirations for the future. Let us view our hopes and aspirations.

Twenty-five years ago they were outwardly expressed by so-called dreamers, men with visions of service in a field that was little understood. The romances of these early days show our dreamers men of purpose, patience and perseverance, and by fidelity to these virtues has grown this great national organization which today is reaching in a helpful way every important industry in the country.

As of old, all men at times dream dreams and see visions, and in our dreams it seems we live somewhere in that great unknown where earth and heaven meet. Dreamers who leave the earth too long are apt to become impractical and of little worth, and just in the same way dreamers who leave the skyline lose the heavenly inspiration and become selfish, sordid and unkind. May we in our dreams fix our thoughts on purposes that will inspire and lead on to a greater service to mankind.

*"For a dreamer lives forever,
"And a toiler dies in a day."*

representatives of 75 organizations, also members during the past 25 years.

Three Honorary Memberships Conferred

AFTER a graceful and appropriate address, "A Twenty-fifth Anniversary," (reproduced at the top of this page), by James H. Gibboney, retiring president of the society, honorary membership was conferred on Robert W. Lesley, William R. Webster and A. A. Stevenson, the first two being the only ones still alive of the seven original incorporators. In each case Secretary Warwick, with suitable and brief remarks, called upon the recipient or his representative, the certificate

of honorary membership being presented by President Gibboney.

Two Living Incorporators Honored

ROBERT W. LESLEY, who is absent in Europe, was represented by R. L. Humphrey, who was the first secretary of the American Section from 1898 to 1900. Mr. Lesley, said Mr. Humphrey, is an expert in cement, and was treasurer of the American Section from 1900 to 1902, and vice-president of the present society from 1902 to 1912.

William R. Webster, who also could not be present, was represented by S. T. Wagner, for many years a railroad engineer. Mr. Wagner particularly men-



Photograph Taken 20 Years Ago at the Society's



A. A. STEVENSON



W. R. WEBSTER



R. W. LESLEY



D. J. MC ADAM, JR.

The Three New Honorary Members and the Dudley Medalist

tioned Mr. Webster's contribution of data on the determination of physical properties of steel from the chemical composition, of his connection with the society as an incorporator and of his work as chairman of the steel committee up to 1913.

A Past President Made Honorary Member

INTRODUCING A. A. Stevenson as the most widely-known and best-beloved member of the society, Secretary Warwick paid a personal tribute to him, particularly referring to the aid and counsel he received from him when he succeeded Mr. Marburg as secretary in 1918. Mr. Stevenson, it was pointed out, was the first chairman of what is now committee A-1 on steel, and was president of the American Association of Steel Manufacturers, and chairman during the war of the gun production club. Mention was made also of his service to the society as a president and past president, as a member of several committees, both as chairman and as vice-chairman, as the society's representative on the American Engineering Standards Committee, and as

the only member of the society who was affiliated with the Interational Association for Testing Materials as early as 1896.

In accepting honorary membership, Mr. Stevenson delivered a characteristically humorous, as well as serious address, discussing the early history of the society, some of its achievements and its future. After paying a tribute of gratitude to the founders, and making a plea that all members be as faithful as they had been and still were, he proposed a toast to which all subscribed.

First Dudley Medal Conferred

PRESENTATION of the first Charles B. Dudley Medal was made by Prof. H. F. Moore, the new president of the society. In asking Dr. D. J. McAdam, Jr., of the United States Naval Research Laboratory, Bellevue, Anacostia, D. C., to rise, Professor Moore called attention to the many valuable publications of Doctor McAdam in addition to the one for which the medal was awarded—his paper at the 1926 annual meeting—in fact perhaps "two medals at the least would be



Convention in Atlantic City, N. J., in June, 1907

appropriate," he added. Referring to the fact that his paper last year combined research studies on corrosion, as well as on fatigue, Doctor McAdam emphasized the appropriateness of the medal in that both corrosion

and failure of metals in service were prominent matters in the work of Doctor Dudley years ago. Many references were made during the evening to the work and inspiration of Doctor Marburg and Doctor Dudley.

Six Technical Sessions Devoted to New Problems

THERE were six sessions devoted to metals and the metal industries. At these 26 committee reports and 16 technical papers were presented. In the following pages only the high lights of the various sessions are covered. Details of subjects and reports untouched will be obtainable from the society's headquarters.

Most of the work done and recommendations made for the year by some of the important committees were reviewed in *THE IRON AGE*, March 24, following the group committee meetings in Philadelphia, March 16 to 18.

All but two of the papers and reports were available in preprinted form.

New Magnetic Testing Methods Made Public

SUBSTANTIAL progress in magnetic testing was brought to light at the session devoted to that subject and to wrought and cast iron. Committee reports on wrought, malleable and cast iron were presented, as well as two reports and one technical paper in the magnetic field.

REVELATIONS on the work done in magnetic analysis and testing were a feature of the convention. These came in the shape of a technical paper and two committee reports from a group of men who have been cooperatively doing a most valuable and far-reaching work.

Inspecting Steam Turbine Wheels Magnetically

THE homogeneity and soundness of the steel in so important a product as a steam turbine bucket wheel can be quite accurately determined without destroying the wheel, according to a paper by J. A. Capp, chief of testing laboratory, General Electric Co., Schenectady, N. Y., entitled "The Application of Magnetics to the Inspection of Steam Turbine Bucket Wheels."

The author briefly presented the facts. The method of testing involves the indication of defects in the metal by changes which they cause in the reluctance of a magnetic circuit of which the wheel under test is the only the variable part. By the use of a galvanometer of high sensitivity, these indications are obtained. The galvanometer is connected to measuring coils, located in the specially designed pole-tips of the electromagnet, between which the wheel is rotated. The paper contains typical charts of tests and photographs of typical hidden defects located by the apparatus. Some of these were thrown on the screen.

In reply to a question as to whether there would be any kick in the curve if the steel in the wheel were uniformly dirty, Mr. Capp said there would be none. Prof. H. F. Moore said, however, that in his researches in fatigue he had tried very hard to obtain uniformly dirty steel, but he believed there was no such product.

New Magnetic Inspection Method Developed

A NEW method of magnetic inspection of much promise was the principal part of committee A-8's report on magnetic analysis, R. L. Sanford, United States Bureau of Standards, chairman.

The new method was developed by A. V. deForest, research engineer, American Chain Co., Bridgeport, Conn. Presentation of the details of the method is given in Appendix I to the report and a further discussion of the method and its use is given in Appendix II as a paper by Thomas Spooner, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh.

A brief abstract of the new deForest method was published in *THE IRON AGE*, May 19, page 1459, when the inventor discussed the subject before the New York Chapter of the American Society for Steel Treating at its May session.

Mr. Spooner's contribution has as its purpose the supplementing of Mr. deForest's results with others obtained under somewhat different conditions and the giving of a more detailed explanation of the principle of operation which is based on the use of the cathode ray oscillograph. Mr. Spooner presented some valuable information from the application of the principle to large material and the use of eddy currents at 10 cycles as well as 60 cycles.

After stating that the importance of this new method could hardly be exaggerated and that the society should be congratulated in having on its program such valuable contributions in this field, Edwin F. Cone, *THE IRON AGE*, asked Mr. deForest as to the probable possible commercial application of his new method. He replied that much work must yet be done and indicated the extreme complexity of the subject, but he felt that there is reason to expect that magnetic analysis will ultimately reveal not only defects as well as different qualities of steel, but sometime may indicate other things, such as grain size, fatigue properties and other important elements.

Duroscope Magnetically Selects Suitable Tools

THE development of another important device called the "Duroscope" was also announced by the committee in Appendix III to its report. Its title was "The



Three of the Authors of Papers.
Left to right—
J. T. Nichols,
S. W. Parr and
J. H. Smith

Duroscope: An Apparatus for the Magnetic Determination of the Durability of Steels," and the author was J. A. Sams, general engineering and testing laboratory, General Electric Co., Schenectady, N. Y. It is an instrument which is adapted to the testing of magnetic materials over very small areas. The purpose of this particular development was to perfect an instrument for the determination of the suitability of tools and cutters and the investigation has been limited thus far to tool steels.

It promises, says the author, to be capable of de-

termining the relative hardness of magnetizable objects in general, in some cases the chemical composition, and to aid in a general way in the study of the structure and properties of the material. As the magnetic characteristics of a steel vary with its structure and composition, this method has been devised and constructed for testing steel as a finished product, or in various stages of its manufacture, to determine whether its properties are normal for steel of that description and treatment. The contribution gives a full description of its construction and use.

New Facts About Embrittlement and Sulphur in Steel

AT the one session devoted exclusively to steel, the report of committee A-1 on steel excited more than the usual interest. Besides this report there were those of committee A-4 on heat treatment of iron and steel, of the research committee, of committee A-9 on ferroalloys, of two joint committees—that on the investigation of the effect of phosphorus and sulphur in steel and that of the joint research committee of the American Society of Mechanical Engineers and the A. S. T. M., on the effect of temperature on the properties of metals. Two technical papers of importance were offered.

TECHNICAL papers on two important problems were features of the steel session.

Caustic Embrittlement Studied Further

FURTHER results of the extended investigation of the embrittlement of boiler plate, carried on by professors in the University of Illinois, were discussed in a paper by S. W. Parr and F. G. Straub, professor emeritus of applied chemistry and special research assistant, engineering experiment station of the university, respectively. Its title was "Embrittlement of Boiler Plate."

The authors present results of a continuation of the investigation reported on in a paper at last year's annual meeting [THE IRON AGE, July 1, 1926, page 4]. This year they state that their results show that the strength of NaOH necessary to produce embrittlement decreases with an increase in pressure and that the time of cracking decreases with an increase in temperature. That there is a possibility of caustic hydrate concentration in the seam, a simple apparatus has been designed to detect, they report.

Inhibition of Embrittlement Possible

Chief interest in the subject centered in a presentation by Professor Parr of some data not in the paper. Very recent results seem to indicate, he said, that inhibition of boiler plate embrittlement may be possible.

The addition to the water of certain definite quantities of sodium phosphate, Na_2PO_4 , or of tannates, indicates a considerable postponement of deterioration of the steel. For example, with the usual amount of caustic soda present, embrittlement took place in 24 hr., but by adding 3 to 5 grams of sodium phosphate, or a tannate, per liter to the water, this deterioration did not take place for several days—10 to 13 days in several cases.

These phenomena are temporarily explained as due

to a reduction of polarity to near the neutral point by these additions. The use of these compounds, and perhaps such others as sodium aluminate, borate and silicate, needs further study but indicate large possibilities.

Claims for a New German Steel Denied

Light on a so-called new type of German steel was given by Mr. Straub, one of the authors. Such a steel had recently been heralded by Doctor Fry of Germany as resistant to caustic attack. Samples obtained with some difficulty showed a composition of about 0.15 carbon, 0.44 manganese, 0.017 phosphorus, 0.023 sulphur, 0.40 silicon and 0.0026 per cent nickel. The elastic limit was about 32,000 lb., and the tensile strength about 56,000 lb. per sq. in. The "new steel" was pronounced as about equal to standard American boiler plate steel and no better.

Discussion

Employment of a manganese steel (2.13 per cent manganese) in the experiments was commented on by John Howe Hall, chief metallurgist, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. This pleased him, he said, but he would like to know just how to define this kind of steel, or manganese steel in the broad sense. Edwin F. Cone, THE IRON AGE, New York, brought up the question of the 1.25 to 1.75 per cent manganese rails and their rapidly expanding use but reported that these are not to be recognized in the annual statistics by the American Iron and Steel Institute as manganese steels, nor even as alloy steels. Is not some classification of this matter essential?

Other speakers said that the term "medium manganese steels" or "manganese bearing steels" are being used. The paper was also discussed by F. N. Speller and by Dr. D. J. McAdam, Jr., the latter, in written form, citing a recent boiler failure at the Naval Academy at Annapolis. He regards the term "embrit-

Three of the Authors of Papers.
Left to right—
J. A. Capp, R. S.
MacPherran and
M. E. Greenhow



tlement" as an unfortunate one and characterizes the phenomenon as "loss of continuity" of the metal.

Sulphur in Plate Steel Up to 0.077 Per Cent Harmless

A PROGRESS report from the joint committee on investigation of the effect of phosphorus and sulphur in steel was presented by Dr. George K. Burgess as chairman. It was not pre-printed but will be available soon in full. Only the conclusions regarding the effect of sulphur in plate material can be summarized here:

Information relative to this material, heat treatment and test results as structural steel in the form of rolled plates with sulphur content varying from approximately 0.03 to 0.08 per cent is presented in the committee's fifth annual report, from which the following conclusions [in part] are drawn:

The sulphur present in commercial plate material up to at least 0.077 per cent, the highest sulphur content examined, is not detrimental, the tests showing no systematic relation between any of the physical properties determined and the sulphur up to 0.077 per cent. The following physical properties determined for sheared plate in the natural, normalized, annealed and quenched conditions showed no systematic relation with sulphur up to 0.077 per cent: Tensile strength, proportional limit, yield point, elongation, reduction of area, shear and bend tests. The original Charpy impact tests and subsequent check tests showed such a wide variation of individual results that no deleterious conclusions regarding the effect of sulphur can possibly be drawn from them. It is evident that this particular type of impact test is unsuitable for rolled plate material.

Chrome-Nickel Steel Strong at High Temperatures

A PAPER, "Some Tests of a High Chrome-Nickel Steel at High Temperatures," by R. S. MacPherran, chief chemist Allis-Chalmers Mfg. Co., Milwaukee, as presented by the author, gave results of a continuation of an investigation reported in a paper by the same author in 1921 at the annual meeting.

N. L. Mochel commented on the great interest in the

subject and presented some similar results he had obtained from a steel of almost the same composition.

Contest Over Steel Casting Specifications Avoided

A CONTEST on the floor of the convention over the specifications for steel castings for valves and fittings for high temperature service did not take place, as fully expected and foreshadowed by committee A-1's action the day before.

The opponents of any elimination of processes in the present tentative specifications were on hand in large numbers. They were prepared, as was the other side also, for a stiff argument. After Chairman Young of committee A-1 had put these special specifications before the full society, Col. A. F. White at once moved that, as a representative of parties directly interested in the elimination of certain processes in the specifications and in view of the fact that a wide difference of opinion existed, the proposed tentative specifications as recommended to committee A-1 by subcommittee XXII be referred back to the committee. This was immediately voted, and the "war was over"—for the present.

Several Specifications Improved

FEATURES of the steel committee's report are the adoption of revisions made in 1925 and 1926 to 12 standard specifications; of advancement to standard of 11 tentative specifications; of proposed revisions of 3 tentative specifications; of the publication of 3 new tentative specifications and of the continuation as tentative for one year of 3 specifications without revision.

Definite progress in agreement on definitions of terms describing heat-treating practice was revealed by committee A-4's report on heat treatment of iron and steel, presented by John Howe Hall, secretary. For the last three years a joint committee, made up of three members each from the American Society for Steel Treating, the Society of Automotive Engineers and the A. S. T. M., has been struggling with this problem. At last an agreement was substantially reached by the drawing up of a set of tentative terms covering 12 different phases of heat treatment. The recommendation of committee A-4 that these be accepted by the A. S. T. M. as tentative was adopted.

More Light on Why Metals Fail from Fatigue

FOUR committee reports and five technical papers were on the program for a session on corrosion, endurance testing and wear testing of metals. At a session on non-ferrous metals and metallography, four committee reports and three technical papers were offered. Only some of the chief points brought out can be reviewed in the following.

A SERIES of papers was presented, all bearing on the important subject of fatigue of metals.

Dr. D. J. McAdam, Jr., of the U. S. Naval Experiment Station elaborated the subject of "Corrosion-Fatigue of Non-Ferrous Metals," which formed the substance of his paper last year—awarded the Marburg medal.

Fatigue Failure of Non-Ferrous Metals

The present contribution gives results of tests on nickel-copper and aluminum alloys. As in his previous work on steel, it was found that, although various forms of cold work and hardening will largely increase the fatigue resistance of the sample, when the same metal is tested under a constant stream of tap water, this improvement vanishes; the hardened metal has in general no better corrosion-fatigue properties than the dead soft samples. Table I gives the results.

Copper is one exception to this; it resists alternating stresses as well when drenched with fresh or salt water as when running dry. This despite the fact that the surface of the copper test piece corrodes badly, whereas monel metal, for instance, acquires only the thinnest patches of rust, easily wiped off with cotton.

Doctor McAdam finds a rough proportionability between the "intrinsic corrosion-fatigue limit" and the corrosion resistance of a series of steels and alloys. It may be that the disruptive effect of solution pressure on the atoms at the surface may be enhanced sufficiently by the mechanical stresses induced during testing, so

that extremely rapid solution of atoms takes place at certain favored spots.

Discussion

F. N. Speller also suggested that the concentration of alternating stresses at these notches would result in

Table I.—Fatigue Resistance of Certain Non-Ferrous Alloys

Material	Tensile Strength, Lb. per Sq. In.	Proportional Limit, Lb. per Sq. In.	Endurance Limit	Corrosion Fatigue
Cold rolled nickel—				
Low anneal.....	131,700	85,000	50,000	22,000
Fully annealed...	77,600	19,000	33,000	22,000
Cold rolled monel metal—				
Low anneal.....	127,200	82,000	51,000	24,000
Fully annealed...	81,900	25,000	37,000	24,000
Cold rolled 48:48 nickel-copper alloy—				
As received.....	85,800	38,000	37,000	23,000
Fully annealed...	78,000	22,800	32,000	23,000
Aluminum—				
Hard temper.....	20,500	12,700	8,500	3,000
Half hard.....	16,000	7,800	7,000	3,000
Annealed	12,600	None	6,000	2,000
Duralumin—				
Tempered (hardened)	69,100	36,800	17,000	7,000
Annealed	33,400	15,100	13,000	7,000

Table II.—Results of Tests on Cast Iron

Cast Iron	Tensile Strength, Lb. per Sq. In.	Compressive Strength, Lb. per Sq. In.	Charpy Tests (Notched-Bar), Ft.-Lb.	Brinell Hardness Number	Fatigue Tests	
					Endurance Limit, Lb. per Sq. In.	Endurance Ratio ¹
No. 91....	26,200	96,000	4.0	162	12,000	0.46
No. 92....	31,600	111,000	11.8	148	10,500	0.33
No. 93....	25,300	85,000	2.2	132	9,000	0.36
No. 94....	20,700	83,500	1.6	91	7,200	0.35

¹The endurance ratio is the ratio of endurance limit to tensile strength.

Table IV.—Results of Static Tests and Fatigue Tests of Cast Iron at Elevated Temperatures

Temperature		Brinell Hardness Number	Tensile Strength (Ordinary Rate of Loading), Lb. per Sq. In.	Tensile Strength (Prolonged Test), Lb. per Sq. In.	Endurance Limit, Lb. per Sq. In.
Deg. Fahr.	Deg. Cent.				
70	20	148	30,000	30,500	12,000
200	95	154	.....	.....	.....
400	205	145	30,500	28,400	.....
600	315	149	.....	.....	.....
800	425	154	29,600	24,900	.....
1,000	540	135	25,600	11,800	10,200
1,100	595	115	.....	.....	.....
1,200	650	60	20,300	7,800	.....
1,400	760	32	11,300	3,500	6,500

a temperature increase, and also prevent the formation of an adherent protective coating. Under such circumstances rapid local corrosion of bare metal would occur, resulting in early break down by the extension of a tiny surface crack inward.

R. L. Templin, of the Aluminum Co. of America, said that tests in his laboratory using R. R. Moore's machine gave very satisfactory agreement with Doctor McAdam's results. R. R. Moore, of McCook Field, tested some thin-walled duralumin tubes after having been exposed to salt-spray for several days. This disintegrated the surface, and lowered the endurance limit from 18,000 lb. to 11,500 lb., thus showing that constant corrosion during the test is necessary to cause the maximum damage noted by McAdam.

Fatigue of Gray Iron Studied

PROF. H. F. MOORE and S. W. Lyon, of the University of Illinois, have been studying four pieces of gray cast iron, representing centrifugal sand-cast pipe (No. 91), a thin cylinder (No. 92), a cylinder with 3 1/4 in. walls (No. 93) and a 25-ton casting (No. 94). The latter was very slowly cooled and the carbon was practically all in the graphitic state. Results are shown in Table II.

Auxiliary tests showed that these endurance limits were increased up to 43 per cent by "understressing" (subjecting the specimens to several millions of cycles just below the endurance limit). A rounded groove cut in the specimen reduces the endurance limit only 3 per cent. Tests at elevated temperatures gave the results in Table IV.

Fatigue Study Solves a Commercial Problem

AN instance of the use of fatigue studies to solve a commercial problem was described by John R. Townsend of the Bell Telephone Laboratories, in a

paper "Fatigue Studies of Telephone Cable Sheath Alloys." Telephone cable has been prone to develop trouble from cracks extending through the lead sheathing. These cracks are located where the cable passes the pole. Since the movement under varying temperature of the supporting steel messenger strand is considerably less than that of the lead cable, bending is caused at the pole; consequently it was thought that the fractures might be caused by fatigue breakdown. Machines for testing full-sized pieces of cable under vibration and bending were devised, and used in conjunction with a special fatigue testing machine, taking 56 small cantilever specimens at once. A microscopic study indicated close similarity between fractures in test and in service. A study was also made of various lead-antimony alloys, and the effect of temperature, heat treatment and pressure of extrusion, to determine the best combination of conditions for the manufacture of durable cable sheaths.

Research on Corrosion of Metals Reported On

COMMITTEE A-5 on corrosion of iron and steel has under way a number of exposure tests, the earliest of them of ten years' duration. Previous reports indicating the superiority of copper-bearing sheet under atmospheric exposure are confirmed, as well as the fact that for culverts and submerged locations the pressure of copper does not give increased resistance.

Much thought has also been given to specifications and methods of test for galvanized products and other coatings, notably chromium. Karl Pitschner of the American Chain Co. uses a quick and accurate method for determining pin-holes in coatings over iron. He sprays on paper a solution of potassium ferricyanide, salt and agar-agar in 20 per cent alcohol, and dries the paper in an oven. This is then ready for the test. The paper is moistened and laid on the clean, dry surface being tested; in two minutes it is removed and



H. F. MOORE



T. D. LYNCH



C. L. WARWICK



J. H. GIBBONEY

Officers of the Society, (Left to Right) the new president and vice-president, the secretary and the retiring president

any blue spots it contains represent perforations in the coating.

This method of testing has the advantages of simplicity, rapidity, and permanency of record. As pointed out by George B. Hogaboom, it is much quicker than the salt spray method of testing coatings, since the latter often has a tendency to wash off small spots of rust. Another member recommended a simple method for irregular surfaces, used extensively on hot-tinned pieces, namely, exposure for 24 hr. in a wooden rack in a steam exhaust.

A subcommittee has started atmospheric exposure tests on galvanized sheet at the locations where the bare sheet is being tested.

Work Progressing in Non-Ferrous Corrosion

CONSIDERABLE work is also being done on the corrosion of non-ferrous metals and alloys. Preliminary accelerated tests show such marked irregularity as to indicate lack of definite specifications for the conduct of such work. Future work is being planned on about eight metals by total immersion in various solutions aerated and non-aerated, by alternate immersion, by spray and by accelerated electrolysis. Atmospheric corrosion tests on sheet or strip of 21 different metals are being planned. In order to avoid travel expense, racks carrying small samples have been devised so that they may be sent section by section to a central place for periodical examination and weighing.

X-Rays Discussed at Second Marburg Lecture

WEDNESDAY afternoon, June 22, the second Edgar Marburg Lecture was given by Dr. George L. Clark of Massachusetts Institute of Technology on the subject of "X-rays in Industry." The lecturer passed quickly over the subject of radiography, which has been put to good use in locating gross defects in steel castings at Watertown Arsenal, crystal analysis which has been utilized by Bain, St. John and others to study obscure problems in metallography, and X-ray spectrometry which is a useful method for detecting traces of metals in alloys.

He devoted most of his time to exhibiting photographic plates made by a very small beam of rays after having penetrated a small sample of the material. These so-called Laue diagrams, when made through a single crystal of metal, take the appearance of symmetrical rosettes, and from these markings the position of the atoms in the crystal may be inferred. In commercial materials, especially if cold-worked to any extent, the pattern degrades into a few splotches, rings, or rays of light, the interpretation of which has not yet been made. However, Doctor Clark was enthusiastic in his prophecy that Laue diagrams would quickly solve many obscure industrial problems in quality of materials.

Company Dues Raised

ONE important development recorded in the executive committee's report and not included in our review of this report in THE IRON AGE last week, June 23, is

The Second Edgar Marburg Lecture Was Delivered by Dr. George L. Clark of the Massachusetts Institute of Technology



Two leading steel metallurgists were made new members of the executive committee—Doctor Langenberg and F. N. Speller. The former is connected with the Watertown Arsenal and the Climax Molybdenum Co., and the latter with the National Tube Co.



F. C. LANGENBERG

the increase in annual dues for companies, firms, corporations, industrial associations or commercial testing laboratories. By an amendment to the by-laws these are advanced to \$30. All other members' dues are \$15, with \$7.50 for junior members and \$3 for student members. By another amendment the cost of membership in perpetuity to the same class of company and other membership is advanced to \$600 and for other organizations to \$300. These changes are expected to increase the society's annual income by \$15,000 to \$20,000.

President Makes Recommendations

THE president's annual address, presented at this session, was an excellent review of the society's origin and activities during the past 25 years and the four years preceding this, or from 1898 when the Ameri-

The Seven Original Incorporators

Henry M. Howe	Robert W. Lesley
Charles B. Dudley	Mansfield Merriman
Edgar Marburg	Albert Ladd Colby
William R. Webster	

can Section of the International Association for Testing Materials was organized. A study of wear losses was recommended as part of the future program and some valuable data were discussed pertaining to locomotive side rod consumption and how losses were reduced by a method of inspection and consequent improvement in product. Felicitation of the committees' work during the year concluded the address.

New President a Leading Physicist

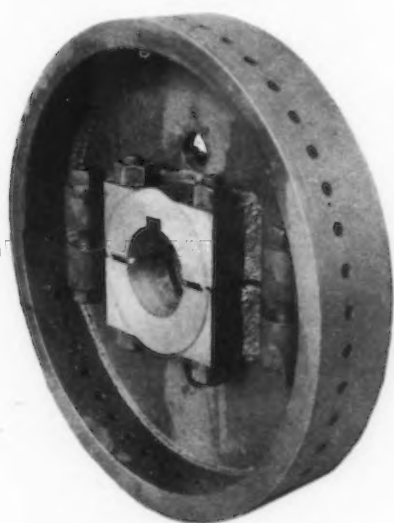
NEW officers of the society were announced in THE IRON AGE June 23. The new president, Prof. H. F. Moore of the University of Illinois has been a leader in the fatigue testing of metals in recent years and has contributed several important papers to the society's programs as well as to other technical organizations. T. D. Lynch, the new vice-president, manager material and processes, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, is a past president of the American Society for Steel Treating. Two new members of the executive committee, prominent in the steel industry, are Dr. F. C. Langenberg and F. N. Speller.

An account of important progress made in testing thin sheet metals as well as the use of the electric telemeter will be published next week.

Making Machines of Rolled Steel

Large Electrical Machinery of General Electric Co.
Built Up by Welding, Extensively Used as a
Manufacturing Tool

An observing visitor at the General Electric Co.'s plant at Schenectady, N. Y., cannot help but be greatly impressed with the amount of welded steel plate and shapes going into large motors and generators. Seemingly the bigger the equipment the more completely has fabricated steel replaced castings. This development has gone forward to the place where it may almost be said that stator frames on all large alternating current units, magnet frames for all



*Rotor Spider
of Welded
Steel Plate*

direct current units, many rotor and armature spiders, base plates and other details are made by the new process.

Direct Current Magnet Frames

Direct-current machinery, including motors, generators and synchronous converters, utilize solid metal rather than laminations for the exterior magnetic circuits or magnet frames. Heretofore cast iron or cast steel has been used. However, castings lack electrical and mechanical uniformity, and hence the designer plans for the poorest acceptable castings and is unable to take full advantage of the best ones.

A casting might well be perfect as far as inspection could determine, and amply strong enough to take care of the mechanical loads, but this non-uniformity in magnetic property led the designer to propose the more homogeneous steel for a substitute. A heavy slab of steel, wide enough to match the magnet pole, thick enough to carry the magnetic flux and of proper length is now heated and bent to a correct circle in powerful rolls in the boiler shop. If it is a closed ring, the abutting ends are welded by a hand-operated metallic arc. The feet, and any bolting lugs, are also attached by arc welding. Each bearing bracket is made of pieces cut from flat plate of correct thickness, welded in place along the edges from both sides. Bolting lugs of round stock laid against flat plate automatically form proper vee notches for welding; they are made long enough so the fillet welds at the two sides develop in shear the full strength of the assembly or foundation bolt. (Full sized tests have demonstrated the strength of these connections.)

This completes the fabrication of the frame. The machine shop then mills and registers the abutting surfaces, drills and fits the assembly bolts, turns the inside diameter, and drills necessary holes to attach the magnet cores and windings.

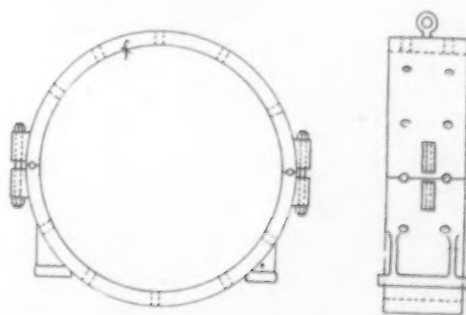
Welding on such a magnet frame for direct-current machinery is of rather minor importance. However, it permitted the use of rolled steel with its more uniform magnetic and electric characteristics, and has enabled the designer to choose dimensions that are highly advantageous. These considerations are of such importance that they have warranted standardization on the rolled steel frame for large direct-current motors.

Base Plates of Steel

Base plates for General Electric machinery have seldom been made to take all the operating stresses. Purchasers have always been notified that such plates were designed to give the necessary location, level, and alignment of the component parts, and to transmit the working loads to a suitable and massive foundation. Consequently, when studying alternative base plate designs in steel, it was unnecessary to provide a large mass of metal to absorb the vibration and shocks of operation.

The requirements have been met by standard H-beams, coped to fit at the ends, and fillet-welded by the metallic arc at all abutting edges. Web and bearing plates are freely used to bridge the gaps between beam flanges, lugs, pads, and chairs welded on at any desired point. Necessary holes for attaching the machinery are drilled to close dimension, but it is ordinarily unnecessary to do any other machine work—bearing surfaces are assembled to close tolerances before welding, and the heat of the arc has proved insufficient to cause appreciable distortion.

It should be remarked, however, that the design of a steel base plate is not a job for the ordinary man in the drawing room; quite the reverse. Unless the layout of steel beams and plates is made by an ingeni-



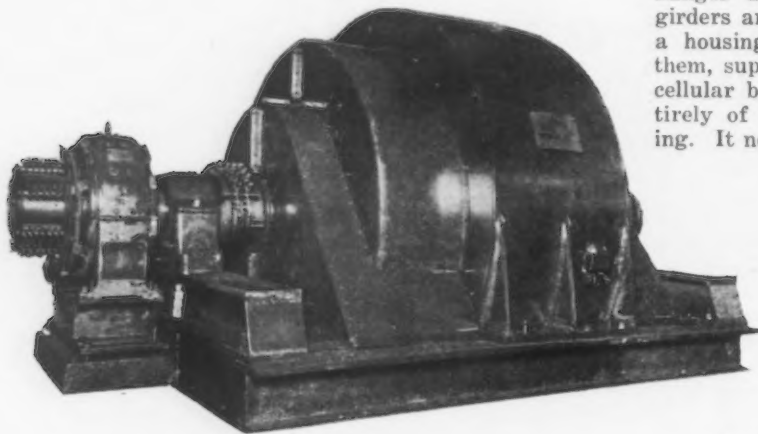
*Simple Construction of Steel Magnet Frame
for Direct-Connected Motor*

ous draftsman, the loss in scrap and in unnecessary welding labor will more than offset the moderate saving in weight.

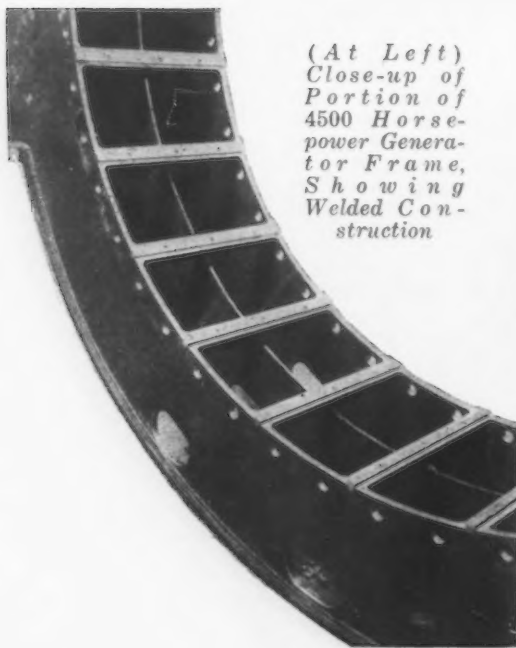
Bearing Brackets for Alternating-Current Generators

A very important proportion of the machinery made at Schenectady goes into hydroelectric and turbo-generator plants. Each generating plant has its own characteristics, such as hydraulic head, total power developed, and electrical characteristics; consequently each is a separate problem in design. Hence here the engineering and manufacturing departments find themselves called upon to make sets of large generators, some of the individual units very large, but seldom more than a few units alike. Under these circumstances the equipment is more "tailor-made" than an

example of mass production. Of course this requires a manufacturing organization of the utmost flexibility. A low-head generating unit may be taken to typify this class of custom built apparatus.



(At Left) Base Plates and Brackets Made From Beams and Plates Welded Together



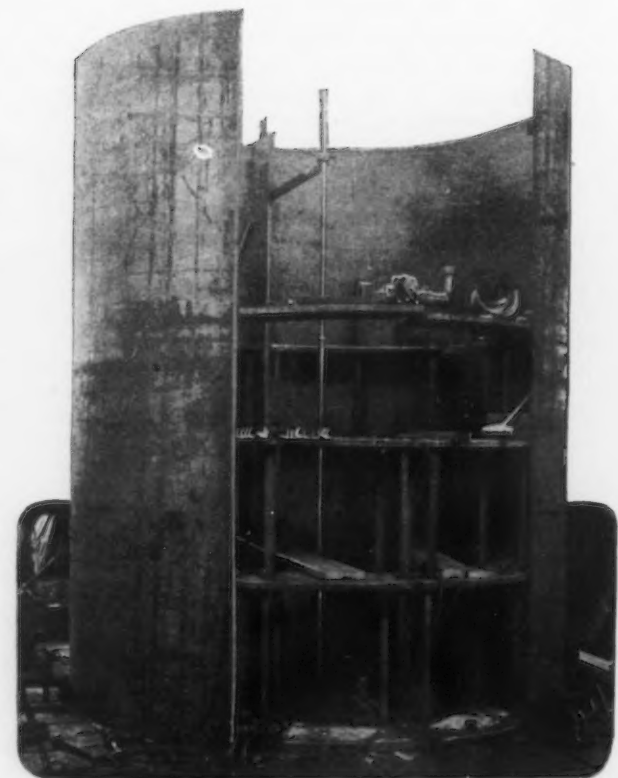
(At Left) Close-up of Portion of 4500 Horse-power Generator Frame, Showing Welded Construction



Lower Cylindrical Portion Is Welded Stator Frame. Upper bearing brackets consist of two welded plate girders

Low-speed alternators are similarly arranged as far as the major characteristics are concerned. The shaft is vertical; to the bottom is hung the water wheel. Between the water wheel and the rotor is the lower guide bearing, held rigidly in place by a structural grillage spanning the top of the wheel pit. The entire weight of a shaft, wheel, rotor, and upper auxiliaries is carried by a thrust bearing above the rotor, supported by beams which must bridge the entire machine. Since slow speed and high output requires a rotor of very large diameter, it developed that for one installation a weight of about 350 tons would have to be carried at the center of a 40-ft. span. These magnitudes are such as to suggest that the older designs using a series of cast iron or cast steel brackets to carry this load should be replaced with another using structural steel girders. It was directly in line with the change in manufacturing methods, so it was decided to build these main girders by arc welding.

A single plate is cut for the web, and two others for top and bottom flanges. They are placed in proper position, each to each, and bolted up tightly through a few lugs tack-welded on for erection purposes. A heavy fillet weld is then run down each edge of the web, using an automatic straight line arc welder. The end corners of the web are trimmed into a circle, and a bent extension of the upper flange welded in place. This gives a neat finish, and provides the necessary column strength at the end reaction. Appropriate web stiffeners, which are nothing but straight pieces of narrow plate, fitting between top and bottom flanges,



All Electric Welded Stator Frame During Construction. Note various erection tools and fixtures

*Automatic
Cutting Ma-
chines for
Shaping
Plates*



members, but also stiffens and braces the two girders, making them act as a unit.

Stator Frames

Such a radical change in design of the main bearing supports, from a series of cast iron brackets equally spaced around the circle to a pair of heavy cross girders, is associated with an equally radical change in the design of the supporting stator frame, if only to care for the fewer but larger concentrated loads.

A stator frame is merely a cylindrical shell or wrapper surrounding a number of rib-like rings, to the inner circumference of which are welded bars for attaching the laminations and electrical windings.

The construction is simple. The shell plate is cut, necessary openings for ventilation made, and rolled to the correct curve. The rings are assembled by segments (having been cut from plate by an automatic cutting blowpipe) butt-welded end to end and then

edge-welded to the wrapper. Up to the limits of shipping clearances, the frame would ordinarily be a single piece: larger diameters would of course be jointed. Reinforcing bars, special struts and lifting bars are welded between the rings at appropriate places and reinforced lugs for foundation bolts attached where necessary. The main frame is thus assembled in steel plate at surprising speed. The entire job is finished, it is emphasized, in about the time it would take to make a pattern for the iron foundry.

Scope of Welded Construction

It must not be concluded that only the record breaking machinery is being welded. Results have proved so satisfactory that steel plate construction is now used in every machine over 5 ft. in diameter, except when it is made on a repeat order where patterns are already on hand, or in the rare instances where the customer is insistent upon cast construction. Alternating-

*Aisle in Weld-
ing Shop De-
voted to Hand
Welding. Large
circles are stator
frames for al-
ternating cur-
rent genera-
tors; smaller
rings are mag-
net frames
for direct-cur-
rent motors*



current generators of various designs, with horizontal or vertical shafts, and synchronous condensers, all have welded stator frames.

The largest power units include the following notable welded parts:

- Lower bearing bracket
- Main stator frame
- Upper bearing girders
- Housing for thrust bearing
- Stator frame for superimposed auxiliary generator
- Rotor for above
- Exciter magnet frame at top of shaft
- Platforms and railings

All, except the last, were formerly iron or steel castings.

Comparative designs in the two materials indicate that the fabricated steel weighs 10 to 25 per cent less than an iron casting. The cost of the steel plate, plus cutting, assembly and welding labor, and materials, plus loss in scrapped trimmings, is less, pound for pound, it is reported, than the cost of iron and all foundry work in the completed casting, without adding anything for the pattern. The saving, therefore, on these large special castings equals the proportionate share of the pattern, plus the saving in weight and cost per pound.

Important though these savings may be, a prime advantage to the alternating current engineering department is the adaptability of the new method; now the designer may make a structural frame to fit the most economical electrical layout, rather than to compress the electrical design into an existing pattern.

Welding Shop

Almost all of the cutting operations are performed by oxygen blow-pipes, automatically guided along correct lines and motor-driven at correct speeds. The blow-pipes use commercially pure oxygen; illuminating gas furnishes fuel for the preheating flames. Since most of the structural elements are bounded by straight

lines and circular curves, the cutting shop is equipped with a number of radial guiding devices and straight-line cutting machines. Good square edges are produced with these machines, equal in smoothness to the work done by a powerful hack saw, and require no further preparation before assembly. An accuracy of less than 1/32 in. is reported.

Much of the welding is performed in fixtures using the automatic arc welders developed and marketed by the General Electric Co. for commercial work. For straight seams, the electrode carrier is driven along a straight track mounted on the top flanges of a beam of appropriate length. For circular seams, the work is usually placed on a slowly rotating turntable; one or more joints may be made simultaneously by fixing automatic welders in correct positions. Sometimes it is more convenient to erect the structure on the floor with a vertical mast at the exact center, mount the welder on an arm extending from this central mast, which is driven slowly around as the joint is made.

Much welding is also done by hand. A good supply of workmen is insured by maintaining a school for welders. The work is proving quite attractive to an intelligent body of men. About two months' training is required to give the necessary manual skill to make sound, clean joints of uniform appearance in heavy steel plate, erected in any position, and with the minimum of mechanical aids. During this training period the student receives no wages; instruction, however, is entirely free. Upon graduation from this welding school, the student is ready to perform numerous welding operations, under personal supervision of the foreman.

The general operations at Schenectady are notable not so much for novelty in the welding equipment or methods, as for the organization of the work, whereby engineering and manufacturing departments have utilized to a high degree the flexibility of the oxy-gas cutting and metallic arc welding processes in the routine production of electrical machinery.

General Movement of Boston Iron and Steel Offices to Park Square District

During the last two months or so there has been a general movement of offices maintained in Boston by steel mills, scrap dealers, pig iron agents and industries affiliated with the iron and steel industry, from the downtown section to the Park Square district. This movement started with the construction of the office section of the new Statler Hotel and has reached its peak with the completion of the Consolidated Building. The Consolidated Building was erected by the Boston Consolidated Gas Co., which is owned by the Massachusetts Gas companies.

Following is a list of companies that have moved from downtown into the Consolidated Building, with the numbers of the rooms occupied:

- Atlantic Tubing Co., 611
- Automatic Heating Corporation, 505
- Boston Elevated Railway Co., 514 and 515
- Buffalo Steel Co., 801
- Bryant Heater & Mfg. Co., 507 to 509
- Cale Metal Products Co., 619 and 620
- Champion Rivet Co., 801
- Columbus Heating & Ventilating Co., 612 to 614
- Combustion Utilities Corporation, 601
- Connersville Blower Co., 612 to 614
- Edison Portland Cement Co., 603 to 605
- Erie Ball Engine Co., 701 to 704
- Fuel Testing Laboratories, 615 to 618
- Glenwood Range Co., 503-504
- Industrial Appliance Co. of New England, 507 to 509
- Kerlow Steel Flooring Co., 801
- Mystic Iron Works, sales department, 1202
- New York Gas Tubing Co., 612 to 614
- New England Coal & Coke Co., 1212
- Pittsburgh Steel Products Co., 801
- Power Equipment Co., 701 to 704
- Railway Device Co., 801
- Reading Iron Co., 506
- Robins Conveying Belt Co., 705
- Rogers Brown & Crocker Brothers, Inc., 922-923
- Rome Iron Mills, Inc., 801
- Semet-Solvay Engineering Corporation, 612-614
- Stack Heater Co., 819-821

- Standard Forgings Co., 801
- Surface Combustion Co., 601
- Tyler Tube & Pipe Co., 801
- Western Railway Equipment Co., 801

Following is a list of those who have engaged space in the new Statler building:

- Aluminum Co. of America, 1022
- American Bridge Co., 1413
- American Sheet & Tin Plate Co., 1414
- Bates Expanded Steel Truss Co., 901
- Carnegie Steel Co., 1420
- Firth-Sterling Steel Co., 816
- General Office Equipment Co., 601
- Holland Furnace Co., 1107
- Illinois Steel Co., 1420
- Ley, Fred T., & Co., Inc., 715
- Link-Belt Co., 1104
- Ludlum Steel Co., 1135
- Luria Brothers & Co., Inc., 713
- National Tube Co., 1416
- Prentiss, Henry, & Co., Inc., 730
- Superheater Co., 705
- Tennessee Coal, Iron & Railroad Co., 1420
- Union Drawn Steel Co., 1115
- Unit Steel Corporation, 614
- Universal Gypsum & Lime Co., 1110
- Wheeling Steel Corporation, 704

In addition, there are numerous offices of companies affiliated with the iron and steel industry, as well as the office of THE IRON AGE, in the Park Square Building.

Deadlock Between Illinois Coal Operators and Miners

A joint wage conference of Illinois coal operators and miners is deadlocked over the stand taken by the operators that the Jacksonville contract cannot be continued and that the miners must carry on negotiations without the Jacksonville scale as a basis for a new wage agreement. The miners are taking the stand that they are bound by the policy committee report to the annual convention of the United Mine Workers at Indianapolis, Ind., which provides that all wage negotiations must be predicated on a renewal of the Jacksonville scale.

Montana Gives Thought to Steel

Proposal for the Building of Plant Based Largely on Ore, While
on the Important Question of Markets Much
Is Taken for Granted

A CAMPAIGN for the starting of iron and steel manufacture has been opened in Montana. In a recent issue of the *Helena Independent* was a long article setting forth the need for such an industry. The writer states that Montana has in close proximity the raw materials needed for steel manufacture: ore, coal, fluxing stone, manganese, besides having chromite, fire clay, oil and gas, cheap hydro-electric power, etc. It is set forth as an axiom that "the center of the iron and steel industry of any country must eventually gravitate to that region where raw materials can be assembled at the lowest cost."

Comparison is drawn between transportation of ore from Lake Superior to Pennsylvania furnaces and cheap assemblage in Montana. The writer refers to a "prohibitive tariff" against eastern iron and steel in the Northwest, caused by freight rates, and points to a survey made in 1917, which showed that this vast Northwest annually paid about \$400,000,000 for iron and steel products which might, he states, have been produced in Montana for "less than half that sum."

He states that while it costs in Pittsburgh about \$12 for the iron ore out of which a ton of steel is made, this could be assembled in Montana at a total charge of from \$3 to \$4; also that manganese ores which cost eastern steel makers \$20 to \$35 a ton can be had in Montana at \$7. He refers to the cheap hydroelectric power of Montana, "giving steel makers there a very distinct advantage."

The Montana writer admits that "thoughtless persons" may question Montana as a location for large steel works because the Northwest is sparsely settled; but he readily disposes of this objection by remarking that these persons "do not stop to reflect that the vast bulk of heavy iron and steel products are actually used in the sparsely settled sections." In conclusion he avers that the "construction of blast furnaces and the first units of steel works probably will be commenced within the next ninety days."

Give a Thought to Markets

Without in any way thinking to blur the fascinating picture presented in the *Helena* paper—for the lure of steel manufacture has been no respecter of sectional lines or of distance from the historic steel centers—certain cautionary suggestions will naturally occur to those of long experience in the industry. In the first place, assembling of materials is not the only factor governing the steel trade. There are markets to be considered also, and these are fully as important as any of the other fundamentals. Birmingham, with its wealth of ore, is an example. With perhaps as much iron ore available as there is around Lake Superior, the Alabama ore production is about one-seventh as great. Probably there is no locality where the assemblage of raw materials is so advantageous as in the Birmingham district. Why, therefore, has not the center of the industry gravitated to that point? It has been a steel-making region for nearly 40 years, and has made iron for a hundred years. The answer is simple, intensity of industrialism—markets.

Montana as a Steel Consumer

The western writer compares Montana and Greater New York as markets, much to the disadvantage of the latter. "The three industries," he says, "using the great bulk of heavy iron and steel are mining, rail-roading, agriculture," and he asks how much mining and agricultural machinery does the City of New York use? "Manifestly, none at all." Greater New York is not so strong in agriculture as are other sections of New York State, but the assertion can be made that no

like area in the United States does more mining—real, straight-out mining, than this same misunderstood aggregation of six million people.

"How much railroading machinery and appliances per square mile of area does the City of New York use?" we are asked and then are answered: "Manifestly, a little." Yes, manifestly a little! Our western friends ought to visit New York. They would learn, among other things, that there are more miles of track upon which cars run in the Borough of Manhattan than in the State of Montana—many more. It is very far from the fact that the vast bulk of heavy iron and steel products is used in the sparsely settled regions. For what purpose would they be used there? Fully 95 per cent of all steel made in America is consumed east of the Mississippi River. Two or three blast furnaces of the Central West would be able easily to supply all the pig iron requirements of the entire inter-mountain region, of which Montana is but a part.

Another Lake Superior Region

This proponent of Montana iron development intimates that Lake Superior ore supplies are not so much; and anyway they'll be gone pretty soon. In fact, "in one of Montana's iron ore ranges, which is over 20 miles long, the average grade is over 65 per cent iron." It is impossible for us to identify this great "range" from the brief reference thereto, but we imagine it is what is known as the Running Wolf district, near Stanford, Fergus County. The U. S. Geological Survey prints an eight-page bulletin (715 F) on this district. It cites a number of assays of which the first 16 show an average of 65 per cent, while the remainder show 53 per cent. As to this divergence the Survey points out: "Analyses Nos. 1 to 16 seem to have been made of selected samples of better ore; Nos. 17 to 26 were made on samples taken by Dwight E. Woodbridge and are probably more nearly average analyses of the ore." In either event the ore is good enough in quality and ample in quantity if the following quotation is justified by exploration: "It is doubtless much greater in quantity of ore than the Marquette, Menominee, Gogebic or Vermillion ranges, and the writer, who is familiar with all these, firmly believes it is greater in quantity than the Mesabi."

Certainly interesting, if true; "plenty good enough, what there is of it, and plenty of it such as it is."

It takes tonnage to make a steel works go, and tonnage can be secured only where business is, where intensive development takes place. Sparsely settled regions do not supply this business. The inter-mountain regions in time may support extensive steel and iron industries; that time will come when they are more closely inhabited than now seems probable. When it does come the genius of the American people will provide these industries, if the raw materials are as ample and as worth while as this Montana enthusiast says they are.

The No. 2 seamless mill at the Lorain works of the National Tube Co. will be driven by two 3000-hp. 250 r.p.m. and one 1500-hp. 62.5 r.p.m. 6600-volt, 25-cycle 3-phase motors, which will be furnished by the Allis-Chalmers Mfg. Co. This mill will produce seamless pipe from 6 in. to 10 in. in diameter.

The New Haven Coke Co., New Haven, Conn., a subsidiary of the Koppers Co., is about to start the construction of a 58 oven by-product plant in New Haven harbor. The company will sell its coke to industrial plants and its gas to the city of New Haven.

Cleaning and Grinding Castings

Arrangement of Tumbling Barrels and Their Drive —Gravity Carries to Grinding Machines

CONTINUING the story of the new two-story foundry for the washing machine factory of the Maytag Co., Newton, Iowa, the present installment deals with preparing the castings for entering into the production units of the plant. Four installments of this article have been published in the four preceding issues of THE IRON AGE.

Cleaning the Castings

IN the new foundry the hot castings are forked from the shakeout conveyor on the second or foundry floor into one of four spiral chutes which carry them down to above the general sorting floor, which is about 6 ft. above the cleaning room floor proper. Fig. 1 shows two of these castings chutes with the sorting tables. In the background is the screen for the sand-handling system described in a previous article.

It will be noted that each of these chutes discharges on to a table which can be rotated. About the table are arranged a number of two-wheeled dump trucks or carts into which the castings are thrown. A charging

bucket for sprues is mounted on a small three-wheeled truck, which is used in handling the bucket off from the sorting platform and back to the charging platform.

Immediately over the chutes in this illustration, concealed by the beams, are long openings or ventilating ducts through which the heat from the hot castings rises and passes away, so as to leave the working space relatively cool.

Tumbling Barrels Grouped Around Sorting Platform

Fig 2 shows the end of the sorting platform with tumbling barrels mounted about three sides. Castings are dumped from the platform into the tumbling barrels and after tumbling are dumped from the barrels on to the platforms beneath them. The front of each platform is arranged with an apron which can be dropped to serve as a sorting bench. The first rough sorting of castings takes place at this point. Castings from a considerable number of the barrels are put directly into tote boxes on gravity carriers, as

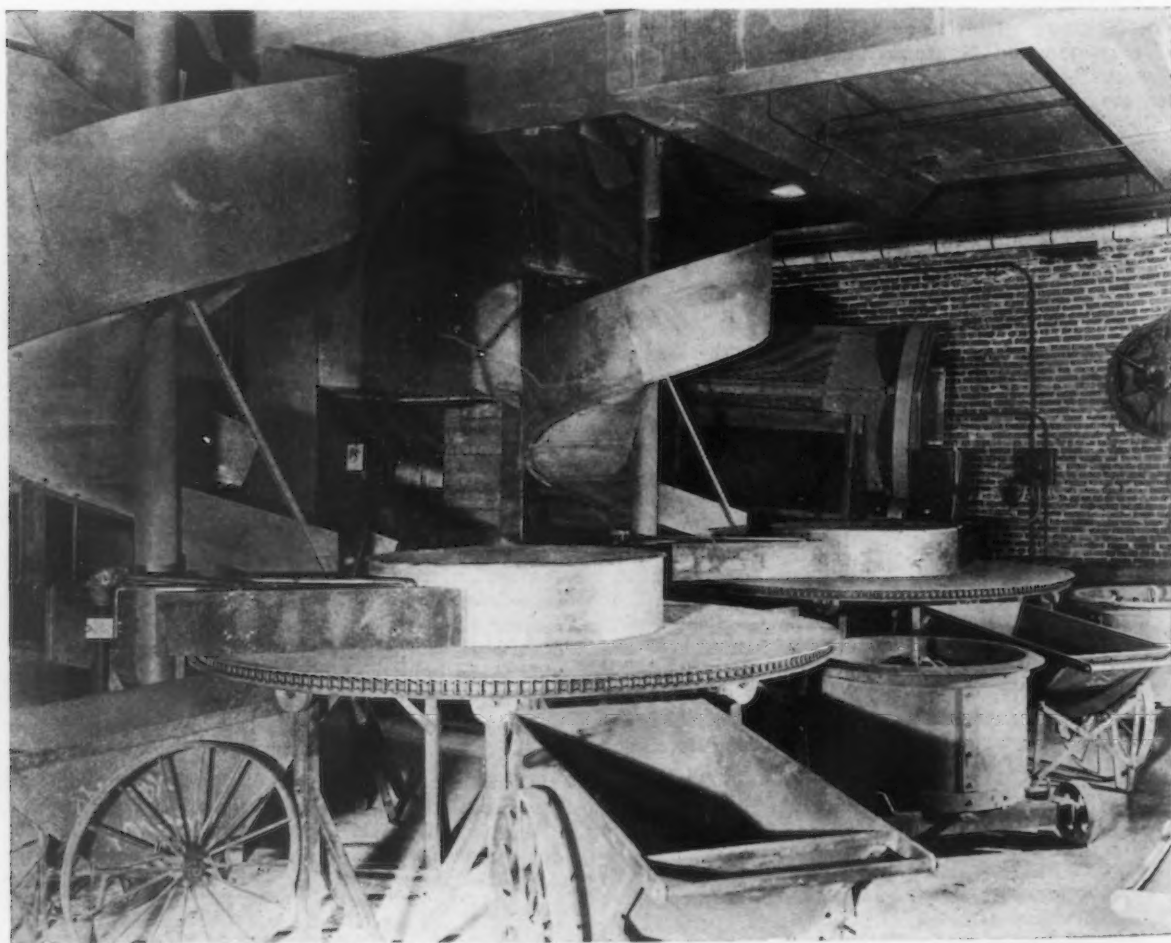


Fig. 1—Spiral Castings Chutes and Sorting Tables. Castings from the floor above land on the circular sorting tables. The sprue is knocked off and thrown into the sprue bucket and the castings into two-wheeled carts, from which they are dumped into tumbling barrels

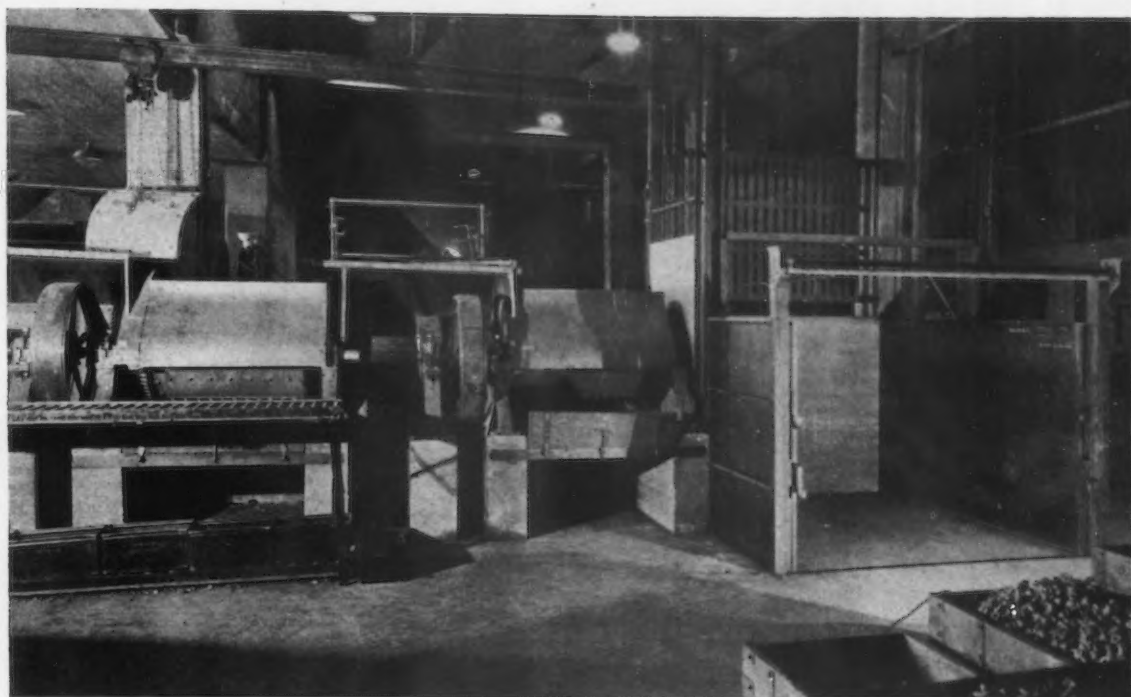


Fig. 2—Tumbling Barrels Arranged Around Cleaning Platform. Castings are dumped into the barrels and from the barrels on to the sorting tables. The elevator at the right handles buckets of sprues to and from the platform

shown on the left, passing directly to the grinding operations. Scrap and broken castings found at this stage of the operation are separated and sent back to the melting department.

The tumbling barrel shown at the right of Fig. 2, and those located at the edge of the platform around the corner, to the right of the elevator, are used for tumbling castings which do not pass directly to the

regular grinding line. Castings from these are taken away in trucks.

The hydraulic elevator shown in this illustration serves to transfer material from the tumbling barrel platform to the general floor level of the first floor of the plant. The buckets for the sprues and scrap are taken up in this elevator, and in the same way the buckets of sprues brought down.

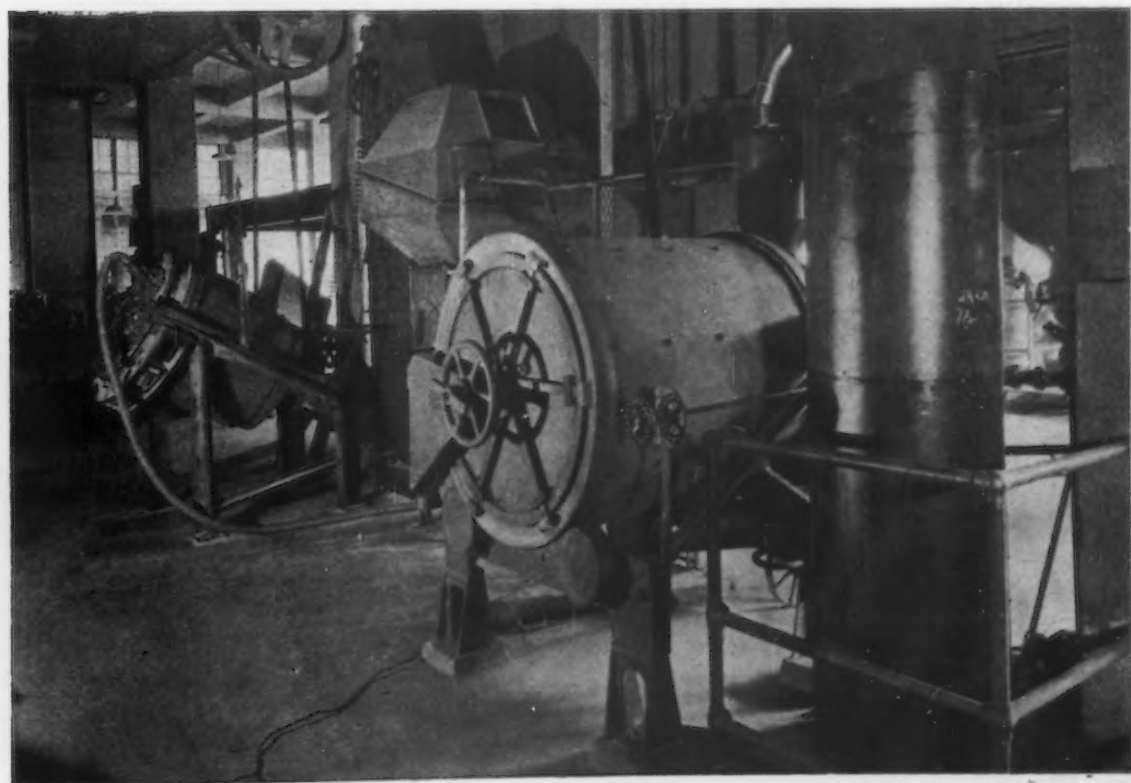


Fig. 3—Sand Blast Barrels and Dust Arresters. The vertical pipe in foreground brings dust from the tumbling barrels to the dust arrester. Each sand blast barrel is connected directly to the dust arrester

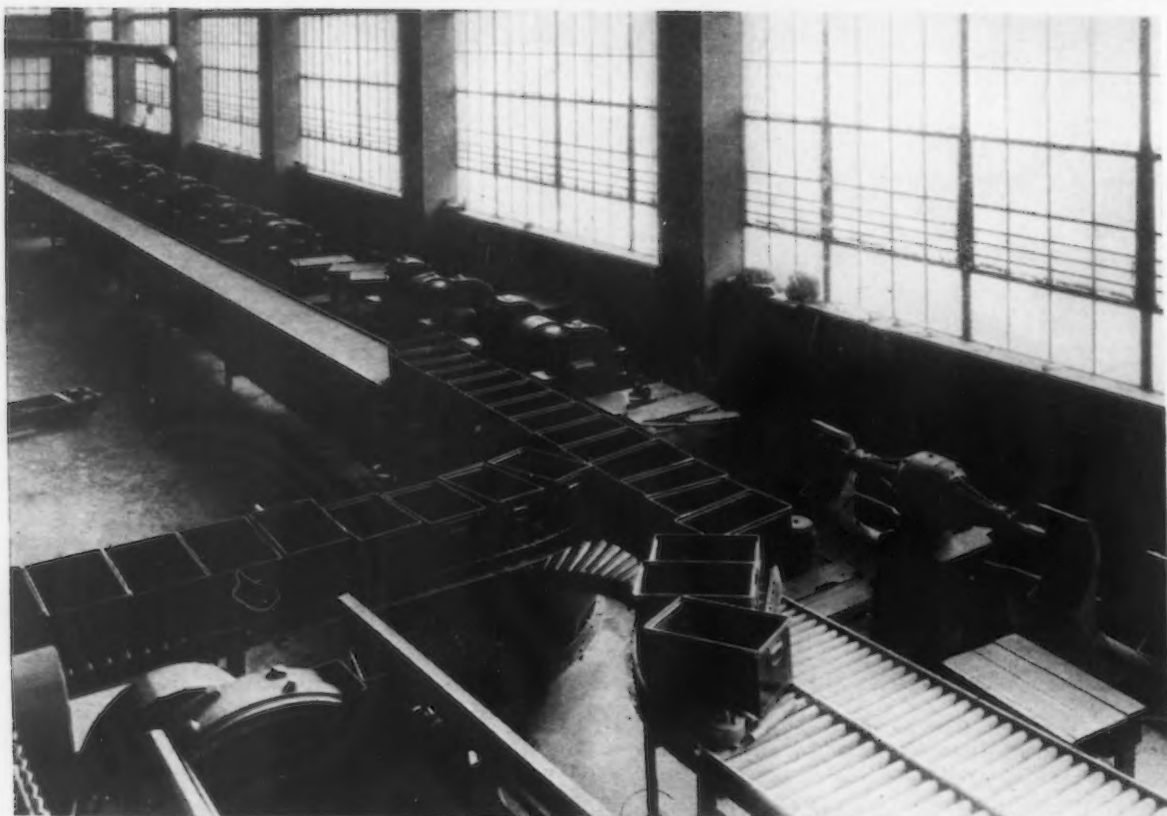


Fig. 4—Grinding and Polishing Department. All castings are finished, so far as the grinding and polishing operations are concerned, in the cleaning room. This view shows about 70 per cent of the machines involved. The dust from these exhaust pipes passes under the floor to the cleaning room or to the dust arresters

Drive arrangements for the tumbling barrels have been provided for by a tunnel under the edge of the elevated platform. In this tunnel are located the

motors for driving the tumbling barrels. Each tumbling barrel is belted to its individual motor. The starters are located above the platform and the bar-

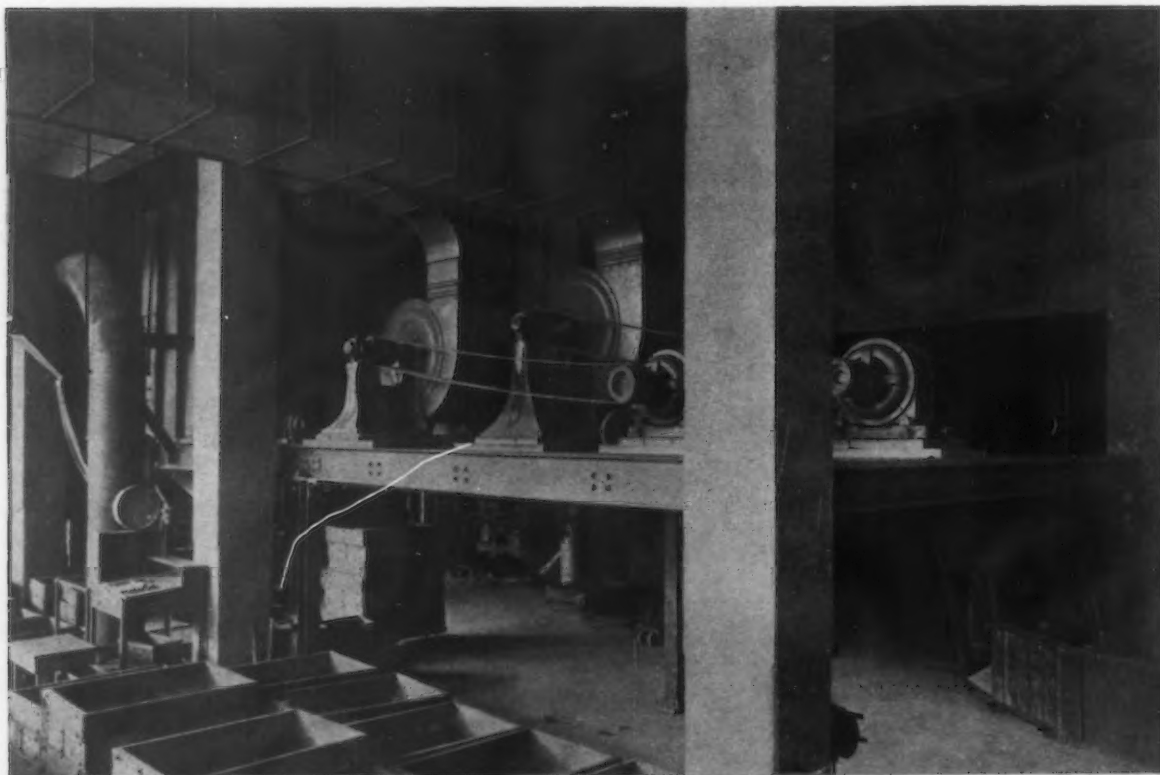


Fig. 5—Dust Arrester Unit with Exhaust Fans. This unit is situated on an elevated platform in the center of the cleaning room in such a way that it does not interfere with transportation on the floor level or with light for essential operations

rels can be moved around to bring the door at any given position and held there. Pipes for taking care of the dust, and exhaust pipes for the barrels, are located in this tunnel. An arrangement of this kind makes the motors readily accessible for maintenance and inspection and gets all the piping out of the way.

Some of the castings require sand blasting, for which purpose a battery of sand blast barrels is provided, as shown in Fig. 3. In the foreground is a New Haven barrel and in the background is a Sly barrel. These are so located that their exhaust connects with the dust arrester behind them. In the foreground of this picture can be seen the main exhaust pipe from the tumbling barrel system, which comes up from under the floor to enter the dust arresters.

Gravity Carriers Used

General handling of castings on the gravity carriers is shown in Fig. 4. The grinding machinery is located along the south wall of the plant. All of the exhaust from the grinders passes down into a tunnel behind them and finally reaches the set of dust arresters in the center of the plant, which will be described later.

In the immediate foreground at the right are visible two sets of gravity carriers. One set is used for taking rough castings to the right, to the head of the series of machines for finishing the wringer frames. Here the wringer frames are first rough ground, then finish ground, and finally polished, so that this operation is

complete in the foundry cleaning room. The finished wringer frames then pass through from the under or lower line of gravity carriers into the open space at the left of the picture, where they are taken on trucks and transported to the machine shops.

The grinders in the background are used for general grinding of all the other castings. The row comprises not only rough grinding but finish grinding, so that all grinding operations have been removed to the foundry. This has eliminated a number of machines from the machine shop.

Proper arrangement of exhaust, proper ventilation of this floor, and ample light have made this an efficient unit and have also made possible an intense activity in the area illustrated.

The dust arrester units are located in the middle of the first floor of the cleaning room unit, as shown in Fig. 5. At the left foreground is seen the spark arrester for taking care of sparks coming over from the grinding system. To the right of and behind this is the dust arrester for the grinding units. Still further back can be seen the dust arrester serving the tumbling barrels and sand blast barrels. Both of these units are belt driven, the motors standing on the same platform that carries the dust arresters.

Dust hoppers of the dust arrester project below the platform, so that the dust can readily be removed by trucks. At the same time the system is sufficiently elevated so that the space beneath the platform is available for storage of castings in trucks.

METAL LATH STANDARDS

Elimination of Specials to Be Pushed During Next Few Months

WASHINGTON, June 27.—Standardization of weights of $\frac{3}{8}$ rib metal lath, with a view to reaching a unity of three varieties, will be investigated by a committee appointed here June 17 at a meeting of producers with the Division of Simplified Practice, Department of Commerce, in an annual revision conference. The committee will consist of W. C. Conger, Truscon Steel Co., Youngstown, Ohio, chairman; E. H. Jones, Milwaukee Corrugating Co., Milwaukee, and J. A. Pfeiffer, North-Western Expanded Metal Co., Chicago.

Certain varieties in the flat expanded metal lath, the $\frac{3}{8}$ rib expanded lath and flat rib expanded lath were adopted as standard, with others noted as special, as marked in the accompanying table. It was the unanimous opinion of the conference that the industry should make every effort to eliminate these "specials" during the ensuing year. An additional variety, 2.50, was added to the painted $\frac{3}{8}$ rib expanded lath. Recommendations of the previous conference were reaffirmed.

Painted steel sheet lath is to weigh not less than 4.5 lb. per square yard, with corresponding minimum weights in this type of lath made from special metals or from sheets galvanized before fabrication. All types of lath are to be specified and sold by weight per square yard. Manufacturers accepting this recommendation and who so desire may stamp or tag their product "Made in accordance with United States Department of Commerce Simplified Practice Recommendation No. 3." The provisions of the revision of the recommendation are to become effective July 1, 1927.

Flat Expanded Metal Lath			$\frac{3}{8}$ Rib Expanded Metal Lath			Flat Rib Expanded Lath		
Painted	Special Metals	Galvanized	Painted	Special Metals	Galvanized	Painted	Special Metals	Galvanized
2.5	2.5	2.5	3.0	3.0	...	3.0	3.0	...
*2.2	*2.2	...	*2.50	...	...	*2.75	...	*3.6
*3.0	*3.0	...	*2.75	...	3.6	*4.0	...	...
3.4	3.4	3.4	*3.4	...	...	...	...	...
			4.0	4.0	...	3.4	3.4	...

*Specials.

Those attending the meeting were: W. C. Conger, Guston Kahn, G. G. Travers, and E. F. O'Brien, of the Truscon Steel Co., Youngstown, Ohio; H. R. Colwell, Division of Simplified Practice, Department of Commerce; M. C. Brown, Berger Mfg. Co., Canton, Ohio; E. H. Jones, Milwaukee Corrugating Co., Milwaukee, Wis.; Clay Wharton, Associated Metal Lath

Manufacturers, Chicago; E. V. Spinosa and George Dorph, Penn Metal Co., Parkersburg, W. Va.; W. B. Turner, General Fireproofing Building Products, Youngstown, Ohio; P. H. Bates, Bureau of Standards; W. W. Galbreight, Youngstown Pressed Steel Co., Warren, Ohio; T. R. Herbert, Consolidated Expanded Metals Co., Wheeling, W. Va.; and L. G. Powell, Bostwick Steel Lath Co., Niles, Ohio.

Chromium Plating Patents Consolidated

General Chromium Corporation, Union Carbide & Carbon Corporation (through its subsidiaries, the Electro Metallurgical Co., the Union Carbide & Carbon Research Laboratories, Inc.) and the Vacuum Can Co., have consolidated their patent rights for chromium plating, and these will be exploited by one corporation known as General Chromium Corporation. The Vacuum Can Co. of Chicago has been active in the development of the electro-deposition of chromium for several years, and has contributed important operating technique in commercial chromium plating.

The process identified by the patents is called Duro-Chrome.

The General Chromium Corporation with its factory and electrochemical laboratories at Detroit, the affiliated plant at Chicago and laboratories at Chicago and Niagara Falls will operate as a production unit and will also license and furnish an engineering service for the Duro-Chrome process to manufacturers desiring to operate their own plating plants.

"The development of the art of chromium plating has been for several years an interesting problem for electrochemists," according to F. M. Becket, president Union Carbide & Carbon Research Laboratories, Inc. "Duro-Chrome, which is a result of additional knowledge and improved technique, will be of great importance to all industries in which the non-corrodible and wear-resisting properties of plated chromium are of definite value."

On the board of directors of the General Chromium Corporation are Fred J. Fisher, General Motors Corporation; Benjamin O'Shea, Union Carbide & Carbon Corporation; F. M. Becket, Burton O. Smith and Roy Gleason of Vacuum Can Co.

M. E. Louth, general manager of the General Chromium Corporation, was for six years general manager of the Udylyte Corporation. Associated either directly or in an advisory capacity are F. M. Becket, Marvin J. Udy, George K. Herzog, Dr. Julius Becker, C. Roy Gleason, Charles H. Eldridge and Victor L. Soderberg.

"ULTRA-SPEED" PLANER DRIVE

52 Cutting Speeds, Ranging from 10 to 85 Ft. Per Min., Obtainable—Speed of Return Is 180 Ft. Per Min.

EASE of control, wide range of cutting speeds, unusually fast return speed, high overload capacity and short stroke operation without damage to equipment, are the outstanding features of a new "Ultra-Speed" planer drive recently developed by the Allis-Chalmers Mfg. Co., Milwaukee.

Control is automatic and precautions have been taken to safeguard the operator. With standard gearing, this drive gives cutting speeds ranging from 10 ft. to 85 ft. per min., with about 50 intermediate speeds. The speed of return 180 ft. per min. A motor-generator furnishes the power for driving the planer motor, taking its current from the main service lines. The motor end of this set can be arranged for either direct or alternating current. Mounted on the same base and direct connected to the motor generator is a small exciter which supplies exciting current to the planer motor and generator fields and also provides safety in case of power failure.

Electric switches and speed regulating rheostats are contained in a steel cabinet, which can be placed in any position convenient to the operator. The starter for the motor generator set is mounted in a separate steel inclosure. This planer motor panel has mounted within it rheostats that are adjusted by means of handwheels on the outside of the cabinet. The handwheels are provided with indicating dials which show the ft. per min. the bed is traversing, both on the cut and return stroke. Push buttons for stopping, starting or inching can be located in any convenient place. The control has been developed in cooperation with the Cutler-Hammer Mfg. Co., Milwaukee.

The motor is supplied with current from the motor generator set and the speed and direction of rotation of the motor are governed by the voltage and direction of current from the generator.

The voltage of the generator is changed by increasing or decreasing the field excitation by means of field resistance. As the armature of the reversing planer motor is tied in with the generator armature, its speed will be governed by this voltage. The reversals are obtained by reducing the voltage to zero and building it up again in the opposite direction by reversing the polarity of the generator excitation. It is claimed that by reversing in this manner, circuits carrying small currents are made and broken and little energy is dissipated.

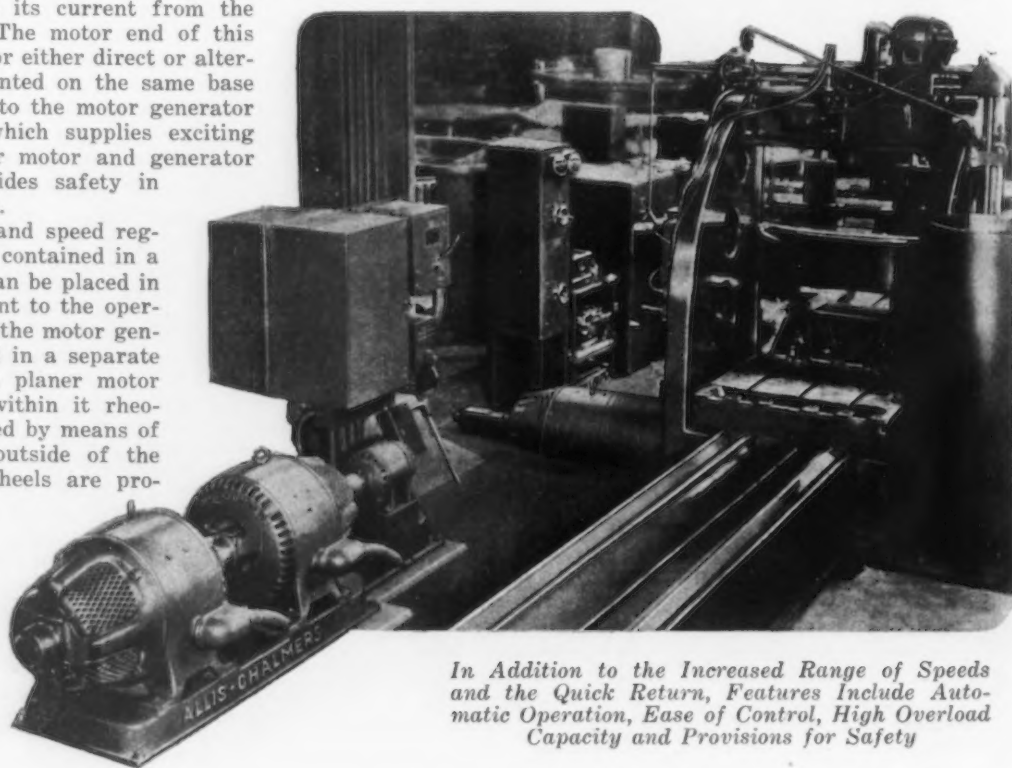
Cutting and return speeds are obtained by adjusting the handwheels which control the cutting and return speed field resistances. These resistances are independent of each other and either the cutting or return speed can be changed without changing the other.

By use of the variable voltage, a wide range of cutting speed as well as return speed can be obtained. In addition to the speeds made possible through varying the voltage, higher speeds above the full voltage speed are obtained by using field resistance in the reversing motor. By means of this combination a speed range from the low cutting speed to the high return speed of 18 to 1 is obtained.

Another feature of this drive is that it permits speeding up between cuts where the work has a gap between cuts, or speeding up the cut after the tool has

entered the work. This is accomplished by small switches mounted on the planer which control the field circuit of the generator.

Two push buttons are provided for inching, and the table moves either forward or reverse only so long as one of these two buttons is held down. Two lower buttons are for starting and stopping the planer after the tools and work have been set. When the start button is pressed and immediately released, the planer table moves forward or reverse according to the position of the master switch which is mounted on the base of the planer. When the start button is held down and the master switch is set for cutting, the table moves forward at high speed but drops down to the required cutting speed as soon as the button is released. The bottom button, which is operated by a pull on the knob, is used for stopping. An overhead arm carrying the control buttons can easily be swung



In Addition to the Increased Range of Speeds and the Quick Return, Features Include Automatic Operation, Ease of Control, High Overload Capacity and Provisions for Safety

around to any position convenient for the operator.

The planer table is equipped with a pair of auxiliary dogs which may be set in any position between the forward and the return dog, causing the planer to automatically speed up at any desired point along the cut and then slow down again just before entering the work. This is useful only on long strokes and interrupted cuts. This feature is cut out by throwing a snap switch, which causes the planer to return to normal operation.

In designing the planer motor, consideration was given to maintaining high torque at the low rotative speeds necessary for the low cutting speeds. Eighty to 100 per cent overload is carried with good commutation; but, under this condition, the temperature naturally rises above normal.

To Build Two New Open-Hearth Furnaces at Kokomo

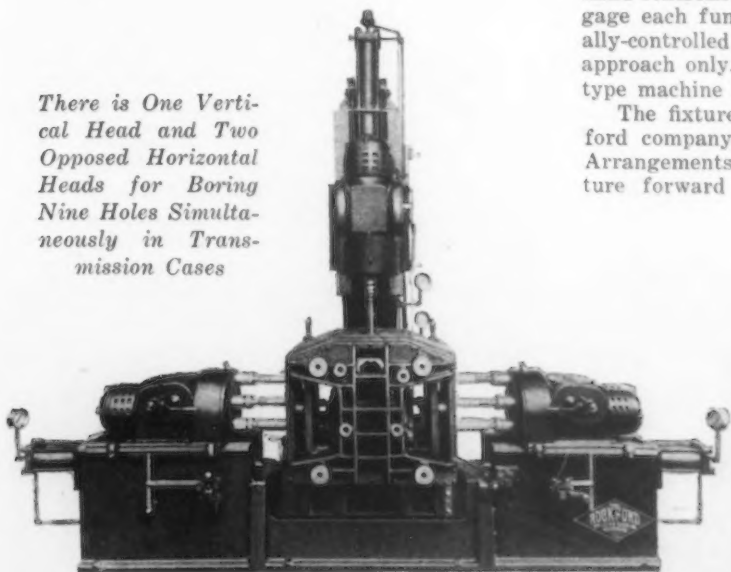
Following a meeting of officers of the Continental Steel Co. at Kokomo, Ind., June 23, announcement was made that work would begin at once on the building of two new open-hearth furnaces and a sheet bar mill at the plant of the Kokomo Steel & Wire Co., a subsidiary. The estimated outlay is \$800,000. With the additions, the ingot capacity of the Kokomo Steel & Wire Co. will be upward of 225,000 tons. The Kokomo plant will furnish sheet bars to the two other Continental Steel Co.'s subsidiaries, the Superior Sheet Steel Co., Canton, Ohio, and the Chapman-Price Steel Co., Indianapolis.

Combination Horizontal and Vertical Three-Way Boring Machine

To meet the demand for a three-way boring machine for heavy-duty high-production work the Rockford Drilling Machine Co., Rockford, Ill., has developed the unit here illustrated. This machine is arranged with one vertical head and two opposed horizontal heads, and is used for boring nine holes simultaneously in transmission cases, each head containing three spindles.

Simplicity of the drive arrangement in each head is a feature stressed. Motors are mounted directly

There is One Vertical Head and Two Opposed Horizontal Heads for Boring Nine Holes Simultaneously in Transmission Cases



in the head and drive through worms, worm gears and through pick-off spur gears for speed variations. The pick-off gears may be changed conveniently from the side of the heads. The heads on the machine shown are equipped with $7\frac{1}{2}$ and 10 hp. motors. In addition to the wide range of spindle speeds provided by the pick-off gears, the head is furnished with two separate speeds, either of which is obtainable by shifting the same conveniently located lever. This lever serves to stop and start the rotation of spindles independently of the motor control. With this arrangement, there are but eight gears in the drive proper. All rotating parts in the drive are mounted in Timken taper roller bearings and run in a bath of oil.

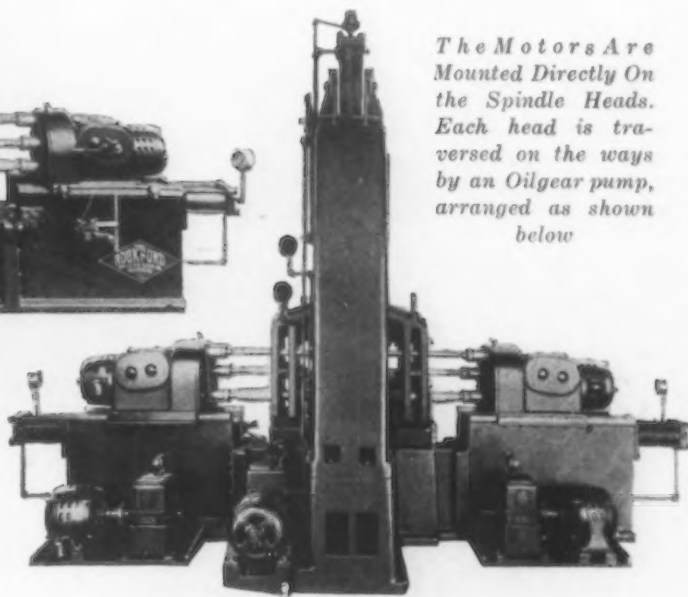
The spindles are provided with ball thrust bearings, and designed as a complete unit, which fits into the front of the head, becoming an integral part of it. They run in double bearings, one on either side of the spindle drive gear or idler, as the case may be, assuring proper alinement and long life. The com-

plete unit runs in a bath of oil. Spindle units are interchangeable in the head, and thus through the use of auxiliary spindle units having a smaller or greater number of spindles to suit requirements, the machine may be used for work on a variety of parts.

The entire head carrying the motor, drive proper, and spindle unit, is traversed back and forth on scraped ways by means of an Oilgear pump and cylinder. Either hand or automatic control is available, and the class of work to be done determines whether each head is operated by an individual pump, or if two or more heads can be operated from one pump. The machine illustrated has three individual pumps and controls, each operated by a 3-hp. 900-r.p.m. motor. With the hand-controlled type of pump the operator must engage each function desired, while with the automatically-controlled pump, the operator engages the rapid approach only. Automatic stops are provided on either type machine for forward and reverse traverse.

The fixture shown on the machine is of the Rockford company's design and is of heavy construction. Arrangements are made for swinging the entire fixture forward on a pivot, and in this position the

The Motors Are Mounted Directly On the Spindle Heads. Each head is traversed on the ways by an Oilgear pump, arranged as shown below



work may be loaded and clamped conveniently.

This type of machine is built in a variety of arrangements, such as single-end, double-end, three-way as shown, or three-way with all heads on a horizontal plane, as well as various other arrangements which might be necessary to accomplish certain work. A variety of sizes are also available, requiring drive motors, ranging from $1\frac{1}{2}$ to 20 hp. Stationary, indexing, cross-sliding or drum-type tables can be furnished, for different classes of work.

Says Profits Will Depend Largely on Intelligence in Buying

"More and more it is being realized that to a considerable extent the profits of the next few years will be in proportion to the intelligence which is displayed in purchasing, which includes consideration of the rate of turnover of materials and finished products," according to W. L. Chandler, secretary National Association of Purchasing Agents, in a foreword to the seventh business organization series of booklets issued by the Policyholders Service Bureau of the Metropolitan Life Insurance Co. The booklet is entitled, "Functions of a Purchasing Agent," and material for it was gathered from actual experiences of 30 organizations throughout the country. The booklet is illustrated with purchasing organization charts of various companies. Copies may be had upon request to the Metropolitan Life Insurance Co.

Accidents Reduced 60 Per Cent in Bethlehem Plants

Accident prevention work of the Bethlehem Steel Corporation has reduced the number of accidents almost 60 per cent since the corporation first undertook safety and first aid education of its employees 11 years ago, according to an announcement made in connection with the annual first aid and mine rescue meet held June 25 at Bethlehem, Pa. Approximately 1800 employees receive a thorough training in first aid and safety work every year and the meet served as graduation exercises. Training in first aid and mine rescue methods has now been given to about 8000 Bethlehem employees.

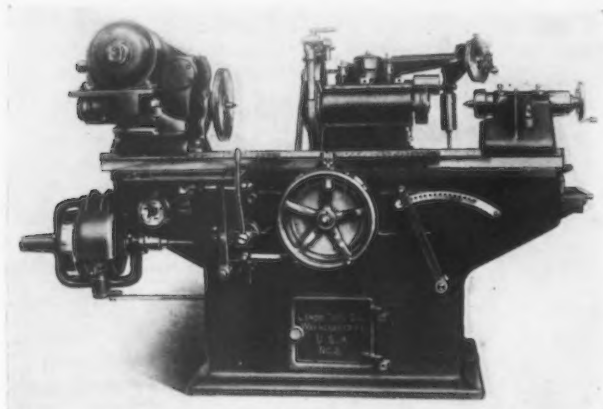
The Philadelphia Foundrymen's Association held its first annual outing Monday, June 20, at Mohican Park, near Philadelphia.

Universal Grinding Machines with Complete Self-Contained Motor Drive

Universal grinding machines arranged for complete self-contained motor drive have been placed on the market by the Landis Tool Co., Waynesboro, Pa. The machines range in size from 12 x 30 in. to 16 x 60 in., and incorporate the features of the overhead driven universal grinders previously offered by the company.

Three motors are employed, one for the work-head, one for the wheel-head, and one for the carriage power traverse and water pump.

The headstock is driven by a $\frac{1}{2}$ -hp. 500 to 2000-r.p.m., adjustable-speed motor with field rheostat control. This motor may be either 115 or 230 volts but it must be of the direct-current adjustable-speed type. It is mounted directly on the headstock, the drive being



The Machine Is Equipped With Three Motors, One Each for the Work-Head, the Wheel-Head and the Carriage Traverse and Water Pump



through sprockets and silent chain to a worm shaft. The power is transmitted by the worm shaft to a worm gear mounted on the spindle. The worm is hardened and ground and the worm gear is of worm bronze. The worm gear is partly submerged in oil, providing lubrication to the driving worm.

A 3-hp., 1750-r.p.m., constant-speed motor, mounted directly on the wheel head slide, drives the wheel-head. The power is transmitted to the spindle through a multiple V-belt, the drive being to the end of the spindle. A spring idler gives the necessary tension and compensates for stretch.

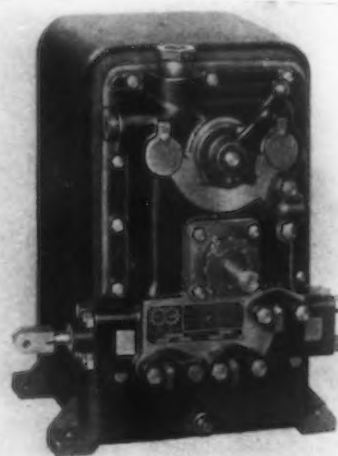
The carriage power traverse and water pump are driven by means of a 2-hp., 1750-r.p.m. constant-speed motor, which is mounted on the rear of the water tank. Power is transmitted through chain and sprockets to a shaft on one end of which is the impeller of the water pump. From the other end of this shaft power is transmitted to a two-speed gear box which in addition to the regular friction speed change gives the traverse speed range. The power from the gear box to the friction speed change is through a belt with gravity idler. If direct current is not available, a d.c. generator may be mounted at the rear of the machine. This generator is driven from the end of the traverse drive motor through a flexible coupling on the end of the shaft.

With this arrangement a larger traverse drive motor is required than regularly specified.

The headstock, which is movable along the swivel table, is arranged for either live or dead spindle operation and can be quickly changed from one type to the other. It is of the universal type and can be swiveled to grind short tapers from zero to 90 deg. It can also be swiveled for face grinding. A single lever controls the starting and stopping of both the work and power traverse. It is also possible to use the power traverse without rotating the work if desired. The regular reversing mechanism used on the previous over-head driven machines is retained on the self-contained types, and the same standard equipment is also available. In weight, the machines range from 5600 lb., net, for the 12 x 30-in. grinder to 7500 lb. net for the 16 x 60 in. machine.

New Oilgear Pump for Machine Tools

A new pump designed especially for hydraulic feeds on the smaller sizes of milling, boring, drilling and other machine tools, has been announced by the Oilgear Co., Milwaukee. The new unit is designated as the type QS. The pump provides forward and reverse feeds and forward and reverse rapid traverse. The feeding delivery is adjustable, and forward and reverse feeds are always equal. Control is either by hand or auto-



The Pump Provides Forward and Reverse Feeds and Forward and Reverse Rapid Traverse

matic by means of a cam. The control valve has positions corresponding to the following positions: Full speed forward (rapid approach); feed forward; neutral; feed reverse and full speed reverse (rapid return). When used with a $3\frac{1}{4}$ in., two-to-one differential cylinder, the pump will give a feeding range from 1.66 in. to 23 in. per min. forward; from 3.32 in. to 46 in. per min. in reverse; and a rapid traverse speed of 93 in. per min. in either direction. Different size cylinders provide different operating speeds. The maximum working pressure is 1000 lb. per sq. in. Power consumption at maximum capacity is 2 hp. The operating speed is 860 r.p.m. or lower.

Pay by Check to Protect Those Handling Pay Rolls

The check system of paying employees, adopted by many large industrial companies in the United States chiefly because of the increase of payroll robberies, is the subject of a special pamphlet issued by the department of manufacture of the Chamber of Commerce of the United States, Washington. The publication discloses that this system is meeting with very general approval, that it has certain advantages over the payment of wages in cash, and that, with minor exceptions, no objection is made to it by the wage earners themselves. It has also been found that the chief consideration is not the safety of the payrolls but the safety of employees handling them that has actuated corporations in adopting the system. Experience has disclosed that, in addition to other advantages, the check system has had the effect of encouraging employees to open bank accounts.



The Vertical Rolls Are Carried in Cast Steel Frames Which May Be Adjusted Vertically to Permit Any of the Several Rolls to Be Used. The frames are in carriers which have horizontal adjustment

Vertical Edging Machine of Improved Design

The vertical edging machine shown in the accompanying illustration, the latest type developed by the United Engineering & Foundry Co., Pittsburgh, is in use at the Alton works of the Laclede Steel Co., Alton, Ill.

In this edger the vertical rolls are carried in cast steel frames arranged for easy vertical adjustment, so that any of several rolls in the frames may be used. The frames are in turn mounted in carriers, each capable of 24 in. of horizontal movement along slides in the housing, by means of bronze nuts, steel screws and handwheels. The vertical rolls are motor driven through completely inclosed forged steel cut miter

gears, and run in unusually large bronze-bushed bearings. Special care has been taken in the design of the bottom bearing to keep out scale and water, a frequent source of trouble in the past.

It is grease lubricated throughout, having a "Key-stone" gun mounted on each end of the housing. The motor is mounted on the motor base at the extreme left, and is coupled to the small speed reduction drive shown, by a flexible coupling. A 35-hp., 400 to 1200 r.p.m. motor is employed, giving a speed range of 655 to 2620 ft. per min. at the rolls. The whole machine is compact, and is mounted on a sub-base for easy removal. It may be inserted in or withdrawn from the line between different mill passes as deemed advisable, by the suitable arrangement of roller tables and the installation of additional sub-bases for its reception.

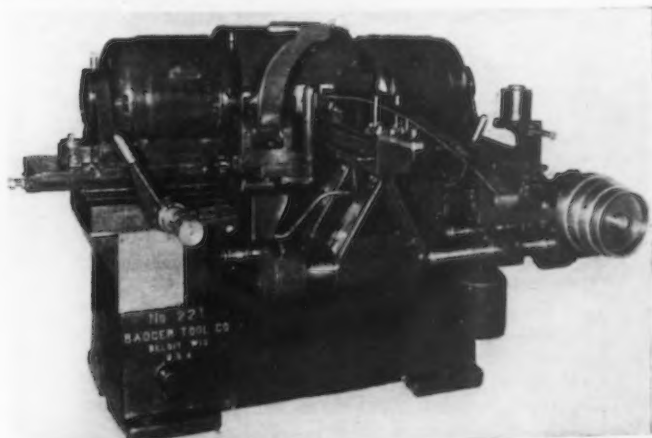
Eyes of Leaf Springs and Bumpers Ground Automatically

Automatic grinding of the eyes of leaf springs and bumpers is the function of the grinder here shown which is obtainable from the Badger Tool Co., Beloit, Wis.

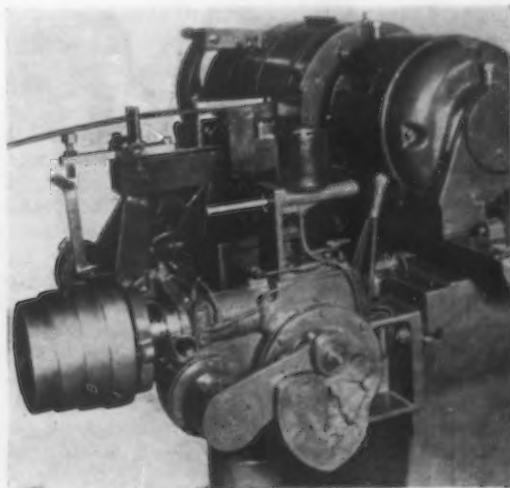
The machine is designated as the No. 221 and is of double-spindle type. Each spindle carries a 16- or 18-in. cylinder wheel, held in chucks, and is driven by a 7½-hp. built-in motor. The work-carrying member consists of a ram adjustably mounted on two parallel arm castings which are supported on two parallel shafts. The inner, or camshaft, acts as a support for the inner arm, the outer shaft is connected to the outer arm and imparts the drive to the work-carrying ram. The camshaft is driven through worm gearing inclosed in a housing and is located at the right-hand end of machine, and is as shown in the close-up illustration herewith.

The large cam which determines the motion of the work-carrying ram is removably attached to the outer end of the camshaft. An arm and roller are rigidly attached to the outer end of the driving shaft. A short distance from the same end of this shaft are fastened an arm and weight, as shown in the front view, which causes the roller to follow the large cam, thereby producing the predetermined motion of the ram which carries the spring eye in and out between the two parallel grinding wheels. This large cam is located away from the path of the grindings, and is accessible for mounting of cams of different shapes. It is claimed to produce smooth action even at high speeds. The cams are formed to give the exact relation between the actual grinding time and the idling time. No clamping of the spring is required.

The grinding wheels open and close automatically in conjunction with the forward and reverse motion of the ram, thereby leaving both hands of operator free to handle the spring. Two cams attached to the cam-



The Arrangement of the Cams of the Leaf Spring Grinder May Be Noted From View at Right



shaft act on the head opening levers—one for each head. These two cams and levers open the heads while two levers and weights at rear of machine close the heads up to independent micrometer stop screws. In operation, the grinding wheels are apart as the spring eye enters. The wheels then gradually close down on it; one or more short passes are made during which the wheels advance up to the stops and remain there while the spring is drawn out to the "idle" period, when it is reversed end to end or a new spring inserted. It is claimed by the manufacturers that the former principle permits high production and at the same time gives increased accuracy and lessened wheel wear. The operation of the heads can be timed in exact relation to the cross travel of ram or fixture, and feeds can be increased or decreased merely by varying the amount of weights used. Four speeds can be secured from a cone pulley on a separate 1 hp. motor.

The main spindles of the machine are mounted in radial and thrust ball bearings which are lubricated with grease through incased Alemite connections. Rotating shafts are carried in Timken roller bearings. The entire machine, including slides, with the exception of the main spindle bearings, is lubricated with the Bowen "one-shot" oiling system. This machine can be furnished in belt drive or bracket type motor drive, also equipped for wet or dry grinding. Cylinder wheels up to 20 in. in diameter and disk wheels up to 24 in. in diameter can be used. The unit illustrated, equipped with built-in type motor drive and arranged for dry grinding, weighs 6000 lb. It occupies floor space of 6 ft. by 8 ft.

Eight-Wheel Motor Trolley Hoist for Minimum Headroom Conditions

Operation in 15½ in. of headroom is an outstanding feature of the motor trolley electric monorail hoist here illustrated, which has been added recently to the line of Lo-Hed hoists of the American Engineering Co., Philadelphia. The hoist is available in ½-ton and 1-ton



The Hoist Is of Standard Design But Is Mounted on an 8-Wheel Trolley to Reduce Headroom Required

sizes. It is similar in construction to the company's standard class A hoist, except that it is mounted on an 8-wheel trolley which reduces the headroom requirement by more than 5 in.

The machine is designed for operation with alternating current at 20 ft. per min. or direct current at 20 to 40 ft. per min. A special high-speed hoist provides for operation at 40 ft. per min. with a.c. and 40 to 80 ft. per min. with d.c. The standard height of lift is 20 ft., but when required a lift of 25 ft. can be provided. Four ropes are used. Remote control of both hoist and trolley motors can be provided.

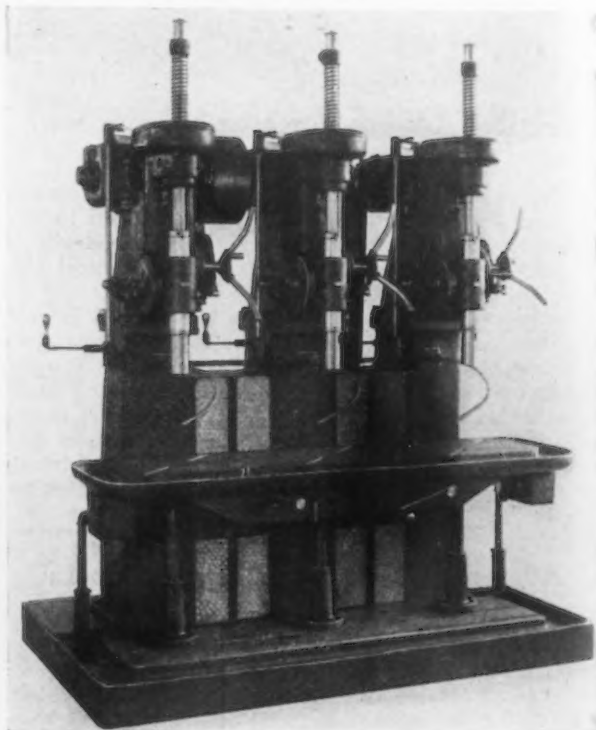
The hoist is arranged to travel around curves of short radius and shift easily over switches. It is protected from dust and moisture by metal covers. Hyatt bearings are used on the gear shafts and in the trolley wheels. Ball-bearing, fully-inclosed motors designed especially for hoist service are employed. The drive between the motor and drum is of the spur gear type and runs in oil. Alemite lubrication is provided on all bearings not lubricated automatically by the oil bath.

Holding and lowering brakes are provided to give full control of the hoist at all times and, combined with a positive acting upper limit device, insure safety in operation.

New Gang Drilling and Tapping Machine for Production Work

The Barnes Drill Co., Rockford, Ill., is placing on the market the ball-bearing, self-oiling, all-g geared, gang drill here illustrated, which is intended for large quantity production where frequent changes of speeds and feeds are not required. It can be arranged for any one predetermined speed and for either one or two quick changes of feed. When it is necessary to change the speeds, the crown gears are exchanged, which may be accomplished quickly. The capacity is for ¾ to 1½-in. high-speed drills in solid steel.

The box column is of sturdy design. The heads are bolted to the column, which arrangement provides for a



Features Include Six Splined Spindle Ball Bearings, Alloy Steel Gears and Dovetailed Rack

raising block or longer column where greater distance is required between the spindle nose and table or base. The head is a unit in itself, containing all the working parts, including the pump for the lubricating system, and the heads may be used conveniently in gang style of two, three or four spindles. A longer column providing greater height or greater swing can be furnished. The base is of new design having a surrounding oil channel, also coolant sumps, and reservoir with the suitable covers and strainers.

Each spindle is provided with six splines, which is stressed as an innovation in drilling machine spindle design. Keys are thus eliminated and it is claimed that there is no binding of the spindle in the crown gear when doing tapping or heavy work. The spindle has a roller thrust bearing, having a double row of staggered short and long rollers. The gearing throughout this is of alloy steel, and all important gears are heat treated. There are ten radial ball-bearings for the gear shafts and crown gears, all bearings being lubricated automatically.

Each motor is directly connected to the drive shaft by means of a flexible coupling at the rear of the head. Silent chain motor drive with a single drive shaft for all spindles may be used in the place of individual motors. A 5-hp., 1200-r.p.m. motor is recommended for each spindle, or a 10-hp., 1200-r.p.m. motor for the three-spindle gang. The single pulley drive is furnished with an inclosed self-oiled multiple-disk clutch

gear for driving with the brake, which automatically actuates on the hub of the gear, instantly when the clutch is released, thus stopping the rotation of the spindle. For tapping, a reversing multiple-disk clutch gear is added, controlled by the vertical shaft and handle. The company's star wheel handle and internal gear construction are employed. The table is of ample proportions. It is gibbed to the double column ways and may be clamped securely in any position. It is supported also by the raising screws, serving as jacks, which is claimed to practically eliminate deflection.

The rack is attached to the sleeve by dovetail construction. A key takes the thrust; no screws are used. The counterbalance chain winds around the internal gear pinion shaft, facilitating the quick return of the

spindle. A safety device is provided in each gang head to prevent overloading. Spur geared feeds are a feature, and power feed may be engaged or disengaged when the spindle is running.

Some of the specifications are as follows: Height of the machine, 76 in.; distance center to center of spindle, 24 in.; distance center of spindle to face of column, 10 $\frac{1}{2}$ in.; maximum distance from table to nose of spindle, No. 4 Morse taper, 27 $\frac{1}{4}$ in.; maximum distance from base to nose of spindle, 45 $\frac{1}{2}$ in.

With each spindle having a direct-connected 1200-r.p.m. motor any single speed from 239 to 2000 revolutions can be provided. With silent chain motor drive, spindle speeds can be reduced to as low as 20 r.p.m. Any one of nine feeds, from 0.005 in. to 0.047 in. or faster for reaming, can be provided, as well as one geared thread leading feed. The floor space occupied by the three-spindle gang is 49 x 80 in., and the weight of the two-spindle gang, with individual motors and starters, is 7650 lb., net.

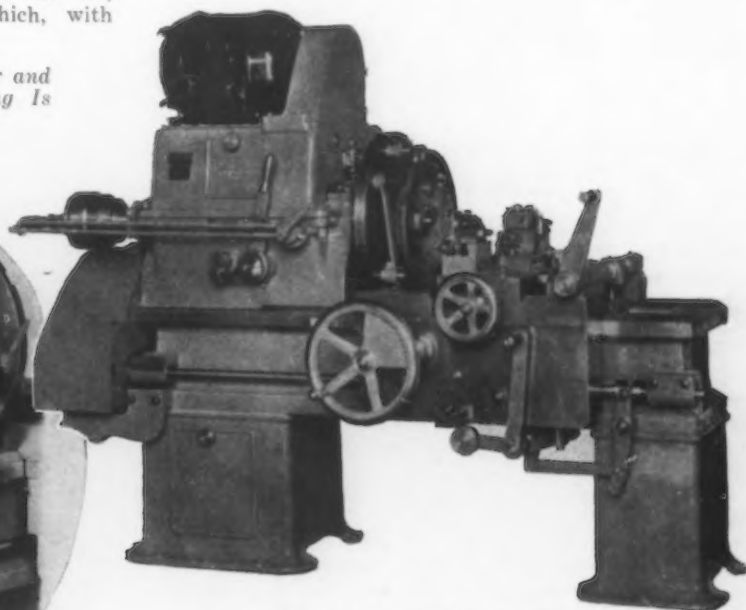
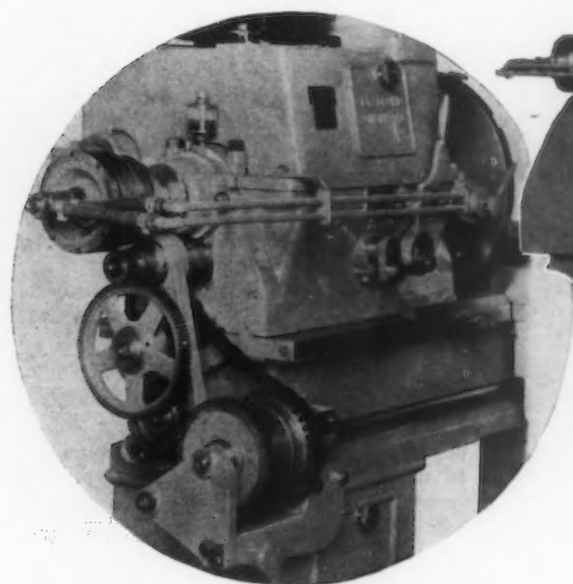
Manufacturing Lathe for Turning and Facing Bell Housing Cases

Means for convenient and rapid chucking of the work, automatic advance of tools and quick return of the carriage and tools are features of the special manufacturing lathe here shown, which is used by a prominent automobile maker for turning of the pilot and facing of the flange of bell housing casings. The machine, a product of the Bradford Machine Tool Co., Cincinnati, is a semi-automatic unit, which, with

housing is then removed and an unfinished bell housing mounted in the fixture.

The faceplate work driver comprises two rods hinged at one end to a sliding shoe in the faceplate. On the opposite ends of the rods driving pins are provided, which pins are loosely guided in slots in the faceplate. With this arrangement, the driving pin at the end of the heavier link pushes against a lug on the

The Arrangement of the Air Cylinder and the Feed and Rapid Return Gearing Is Shown in View Below



The Lathe Is a Semi-Automatic Unit. With changes in tooling and fixtures it may be used for a variety of work

changes in tooling and fixtures, may be employed for a variety of work.

The set-up and operation of the machine is as follows: Having properly mounted and securely air-chucked the first "bell housing" in the special fixture on the nose of the spindle, the tool carriage is hand traversed to the left, by means of a rack and pinion, up against a fixed adjustable stop. In the latter position the carriage is securely fixed to the bed by means of a powerful eccentric clamping device. The control lever is then shifted, causing both the front and rear set of cutting tools to be advanced toward the work by means of the power-driven cross-feed screw. When all the tools have come to the end of their respective cuts, an automatic power feed cut-out acts, permitting the operator to slightly hand feed the tools to a positive diameter stop in order to maintain accuracy and size duplication on all the bell housings.

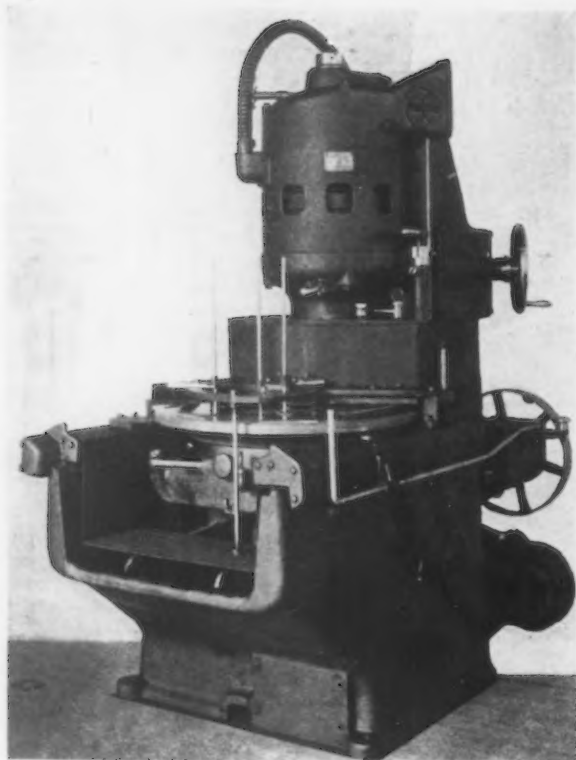
Having first disengaged the carriage clamping device, the control lever is shifted to its automatic quick-return position, which effects simultaneous quick recession of both the front and rear cutting tools, as well as a quick return of the tool carriage itself back again to its inoperative position. The finished bell

bell housing while a second driving pin at the end of the lighter link pulls against a second lug on the bell housing. The single sliding shoe at the hinged ends of the links serves to equalize the push and pull strains against the two lugs on the bell housing, thus resulting in a balanced drive for the work.

The arrangement of the air cylinder and the feed and rapid return gearing may be noted from the insert illustration. The lever on the front of the head in its left-hand position applies the power to the spindle and in its right-hand position this lever quickly stops the spindle through the application of a powerful spindle brake.

Reductions in prices of its rubber condenser tube cleaning plugs, amounting in some cases to as much as 45 per cent with an average reduction of almost 30 per cent, is announced by the Mannion & Arthur Co., Perth Amboy, N. J.

Electrically cooled drinking water is to be provided for the 12,000 workmen of the Homestead works of the Carnegie Steel Co. by the installation, by the Frigidaire Corporation, of some 200 water coolers.



Special Surface Grinder for Asbestos Clutch Facings

Asbestos clutch facings of either the molded or woven type may be ground rapidly on the machine here shown, which is built by the Blanchard Machine Co., Cambridge, Mass., and is a modification of its No. 16 high-power surface grinder.

Production varies according to the size of the facings. On facings 10 in. in diameter, removing 0.015 in. stock on each side, production is at the rate of over 1200 pieces, or 2400 surfaces, per hour. They are parallel within 0.002 in., and are held to size within plus or minus 0.002 in.

The work table of the machine is of cast iron, and is fitted with steel cleats arranged to leave pockets to receive the work. A stack of the clutch facings is placed in the vertical magazine and as the table with its cleats passes under the pile each set of cleats receives one piece of the work from the bottom of the pile. The work is held down in contact with the table by presser feet which are stationary, but adjustable for different thicknesses of work. These are the curved



The Magazine Is Adjustable for Clutch Facings Ranging From 6 to 12 In. in Diameter. A second magazine, for facings from 3 to 6 in., can be furnished

bars seen to the right and in back of the pile of work. They extend from the magazine around to the grinding wheel and also cover the space inside the grinding wheel, so that the work is held down against the table either by the presser feet or the grinding wheel throughout its travel. After coming out from under the wheel the work is lifted and discharged from the table by an inclined shoe and guide, seen at the left of the magazine.

Grinding is done in one pass under the wheel, usually removing about $1/64$ in. of the material. The grinding is done dry and the waste material is removed by an exhaust system. The wheel and the portion of the table where the grinding is done are completely inclosed by guards to prevent dust escaping into the room. The loading and unloading positions are entirely outside of the guards, in full view of the operator. Wear of the wheel is slight, and a simple hand feed it used by the operator as needed.

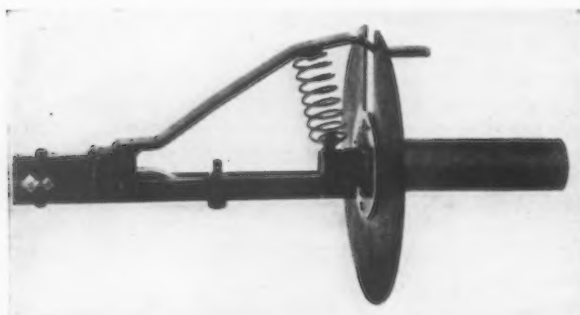
The magazine is adjustable for facings ranging from 6 in. to 12 in. in diameter, and a second magazine can be furnished for handling facings from 3 in. to 6 in. in diameter. The presser feet are designed to handle all sizes up to 12 in. in diameter and thicknesses up to $5/16$ in. The cleats on the table have to be changed for any considerable change in diameter of facing.

Heavy Current Electrode Holder

A 600-amp. holder designated as the type TR, for metal electrodes up to $1/2$ in. in diameter has been added to the line of welding accessories of the Lincoln Electric Co., Cleveland.

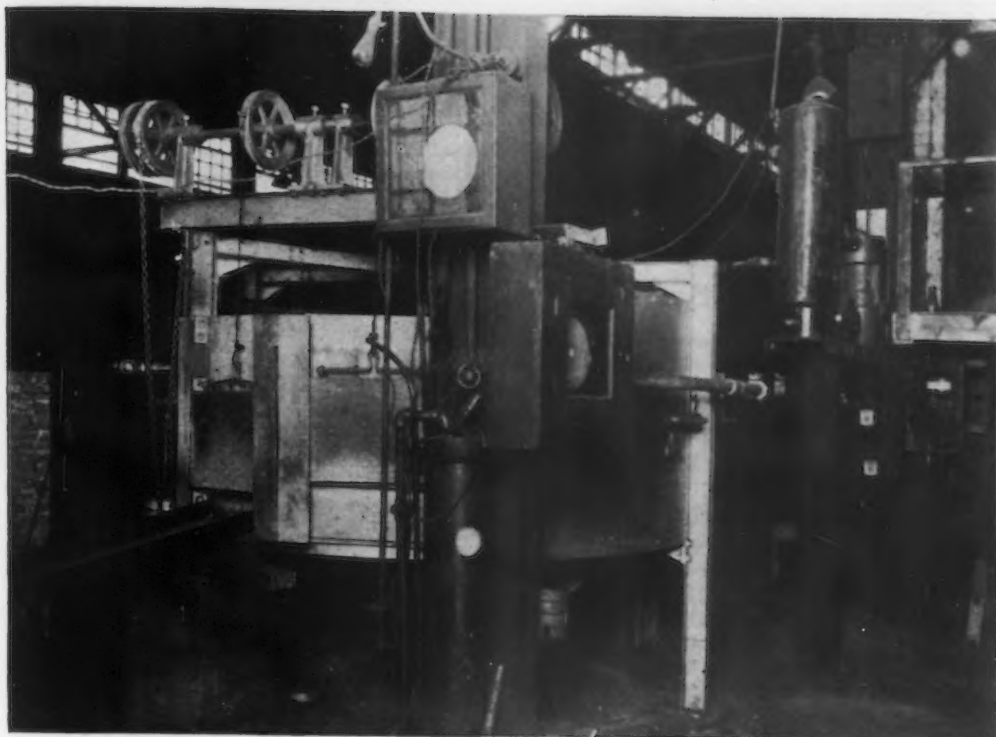
Improvements claimed for the holder include replaceable copper jaws, four-line contact for the elec-

trode, all-copper path for welding current, and structural steel construction. Light-weight and good balance, insulated and ventilated handle, and shield for protection of the operator's hand are other features. It is pointed out that in the handling of the heavy currents which are becoming common in manual metal electrode welding practice, all of the features mentioned are of primary importance.



Replaceable Copper Jaws and Four-Line Contact for the Electrode Are Features

One of the largest ore vessels in the fleet of 90 operated on the Great Lakes by the Pittsburgh Steamship Co. was launched on Saturday, June 25, at the yard of the Toledo Shipbuilding Co., Toledo, Ohio. It is named for B. F. Affleck, president Universal Portland Cement Co., a subsidiary of the United States Steel Corporation, with plants at Chicago, Duluth and Pittsburgh. The boat will carry ore to Lake Michigan and Lake Erie ports, limestone from Michigan to steel plants and cement plants at Chicago, Buffington, Gary, Lorain and Duluth, and coal from points on Lake Erie to ports on Lake Michigan and Lake Superior. It is a 12,000-ton vessel, 604 ft. long and 60 ft. wide, and is equipped with a triple-expansion engine and three Scotch marine boilers.



The Furnace Is Loaded With 800 to 1000 Lb. of Castings and Has a Capacity of 4 to 5 Tons in 9 Hr.

Continuous Furnace Used to Anneal Steel Castings

Annealing Period Reduced as Much as 2 Hr. by Rotary-Type Oven
at Detroit Plant

A CONTINUOUS annealing furnace of the rotary type was recently placed in operation by the Detroit Steel Casting Co., Detroit, for annealing miscellaneous steel castings. Its use is resulting in a reduction of 1 hr. or less, to 2 hr. in the time required for annealing, which ranges from 6 or 8 hr. to over night when the usual practice is followed of stacking the work and annealing it in a car-type furnace.

On the work for which it is used the new furnace is taking the place of the car-type furnace. It is a standard type of gas-fired oven for heat treating work. The inside of the annealing chamber is 3 ft. in diameter, 2 ft. wide and 14 in. high. The furnace burns city gas, supplied at 10 lb. pressure through a motor-driven compressor.

The furnace is being run successfully on production work, but it has been used for such a limited time that its operation is still to some extent in the experimental stage. The furnace has automatic temperature control, its temperature being set at 1650 to 1750 deg. Fahr. A rotating table in the chamber is driven by a motor located on the top of the furnace through a Reeves variable transmission and a worm gear speed reduction. The furnace is loaded with 800 to 1000 lb. of castings, and its annealing capacity is from 4 to 5 tons in 9 hr. It is being used for annealing castings weighing

from less than 1 lb. up to 60 lb., although castings weighing over 100 lb. have been annealed in the furnace.

In making tests a steel bar $\frac{3}{4}$ in. in diameter and 20 in. long was bent 180 deg. after having been in the furnace about 40 min. A small casting for an automobile brake head is being annealed in 20 min. Castings with sections up to 5 in. thick have been annealed in the furnace. Light thin sections make one circuit of the furnace, but heavy castings are allowed to remain in the chamber for two or more rotations.

The furnace has two doors, one for loading and the other for discharging the work. The castings, on leaving the furnace, slide down a steel channel into the brick shell of an abandoned furnace, where they cool more slowly than when exposed to room atmosphere. This, however, is only a temporary expedient to prevent too rapid cooling. The castings annealed in this furnace have less scale than those annealed in the car-type furnace. In fact, some are so free from scale that they are not put through tumbling mills before shipment. While output is not increased with this type of furnace, it has the advantage of continuous operation and permits the making of quicker shipments of emergency orders.

Electrochemists Announce Plans for Northwestern Trip

Technical papers far above the average in importance are promised for the three technical sessions to be held during the Northwestern trip of the American Electrochemical Society, Sept. 4 to 20. The first session will be held at Minneapolis, Sept. 5; the second at Vancouver, Sept. 11, and the third at Keokuk, Sept. 20. Local committees have been formed in many of the towns to be visited, under the general direction of L. K. Armstrong of Spokane.

An educational opportunity is afforded by visits to the mines, ore dressing and smelting plants and research laboratories of Butte, Anaconda, Wallace and Kellogg. Large water power developments of the

Northwest will be inspected at Spokane, Seattle and Great Falls. At Great Falls the Montana Power Co. will conduct the party through their Volta and Rainbow plants, hydroelectric developments of 90,000 and 50,000 hp. respectively. A side trip to Trail, B. C., will be made to visit the "most complete electrometallurgical plant" in the world. Among the metallurgical studies being carried out there are experiments with the electric furnace to treat iron accumulated from non-ferrous mines. A stop of one day is planned in Glacier National Park.

The society will have a special train. The estimated cost of the trip is about \$182 from Chicago and return, including berth and meals. Reservations should be made through the secretary's office at Columbia University, New York.

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Direct-Metal Castings à la Ford

SPECULATION regarding the Ford direct-metal process has been going the rounds ever since the first trials of equipment for that purpose. Like many another essay, much water passed over the dam before the wheels were turning smoothly—various schemes, found wanting, were discarded and for them were substituted others offering greater prospects of success. Now the matter has progressed to the stage where the Ford management has confidence in it.

This week's story of the working of the accepted process, therefore, clears up what had been a mass of undigested information—and much misinformation. Control of the analysis of the iron going into castings, close adjustment of the temperature of pouring and the use of large tonnages of raw pig iron, without undergoing the heavy expense of refining, all combine to mark a new milestone in the progress of the foundry industry.

This Issue in Brief

Paying wage-earners by check is gaining in favor among large manufacturers. Not only are payrolls safeguarded, but also the employees who make up the pay envelopes. Objections to being paid by check are rare. Another advantage of the newer system is that it encourages workers to open bank accounts.—Page 1892.

Decline in commodity prices may be checked. Though the May average was the lowest in five years, being 144.1, it was substantially the same as the April figure, which was 144.2.—Page 1935.

Steel castings annealed in continuous rotary furnace have less scale than those annealed in the car-type furnace. Some castings annealed in the rotary furnace in a Detroit foundry are so free from scale that it is not necessary to put them through the tumbling mills.—Page 1897.

Less than half of all metal-working machines in use are more than 10 years old. Investigation reveals that 44 per cent of the 1¼ millions (estimated) of metal-working machines in use in the United States have passed their tenth year in service.—Page 1933.

Welded steel plate and shapes are displacing castings in the manufacture of heavy electrical machines. One of the largest manufacturers is now using steel construction for every machine over 5 ft. in diameter, except on repeat orders where patterns are already on hand.—Page 1883.

Enthusiast believes Montana will rival Pittsburgh as a steel center. He bases his argument chiefly upon cheap ore and upon the assumption that the producing industry inevitably gravitates to the region where steel can be made at the lowest cost. Geographical distribution of demand is given scant consideration.—Page 1885.

Gravity does a full day's work in the Maytag foundry. Castings are carried by gravity from the casting floor to the sorting floor, and by gravity again to the cleaning room floor, set six feet lower.—Page 1886.

Embrittlement of boiler plate can be retarded by adding sodium phosphate or tannates to the water. The temporary explanation of the phenomenon is that the addition reduces the polarity to near the neutral point.—Page 1877.

Direct metal used successfully in casting Ford cylinder blocks. The blast furnace metal is used in a proportion 50 to 60 per cent of the total mixture, the remainder being cupola metal. From a hot-metal mixer the metal goes through electric furnaces, where it is brought up to pouring temperature. By varying the proportions it is found possible to control the silicon content even more closely than with 100 per cent cupola metal.—Page 1869.

Locates defects in steel magnetically. A supersensitive galvanometer registers changes in the reluctance of a magnetic circuit, warning of hidden flaws in the metal.—Page 1876.

Export business in steel is better than it was last year, but our purchases from foreign producers are lower. Reports for the first five months reveal that exports are 17 per cent above same period of 1926, while imports have dropped 15½ per cent.—Page 1936.

Corrosion - fatigue resisting properties of hardened nickel-copper and aluminum alloys vanish when metals are tested in water. Under this condition they are found to give no better results than dead soft samples. Copper, however, is an exception. It resists alternating stresses as well when drenched with fresh or salt water as when dry.—Page 1878.

Sulphur in plate steel up to 0.077 per cent is harmless. Tests reveal that this sulphur content, the highest in the samples obtained, had no deleterious effect on the physical properties of steel for structural purposes.—Page 1878.

Hardness of steel can be measured magnetically, engineer believes. As magnetic characteristics of steel vary with its structure and composition, newly constructed apparatus is expected to determine the relative hardness of steel products, such as cutting tools and dies, in the various stages of their manufacture.—Page 1877.

Will 1927 steel output be below 1926? Recent news tends to support forecasts made in December that this year would be slightly off from last year in point of tonnage, possibly 10 per cent.—Page 1902.

Fatigue limit of audiences should be studied by program arrangers for society meetings. Perhaps a law could be passed making it a criminal offense to schedule more than three technical papers in a single meeting. In the meanwhile, the members of afflicted societies sometimes take the law into their own hands by refusing to sit through over-lengthy sessions.—Page 1903.

United States is credited with producing 57 per cent of world's machinery. Investigation made by the German Engineering Association reveals that the United States' share of the total business has increased from 50 per cent in 1913 to 57 per cent in 1925. Great Britain is second with 13.6 per cent.—Page 1901.

Profits during the next few years will be influenced considerably by intelligence displayed in buying, says secretary of purchasing agents' association. Included is the consideration of the rate of turnover of materials and finished products.—Page 1891.

Array of Metallurgists for Steel Treaters Technical Program

Some of the country's leading scientists and research investigators in the field of steel-treating and kindred interests will be on the program of the annual convention of the American Society for Steel Treating to be held in Detroit the week of Sept. 19, during the same week as the National Steel and Machine Tool Exposition. The technical sessions will be held in the Statler Hotel, each morning and afternoon from Monday to Friday. At the same time, the convention of the American Welding Society, the Society of Automotive Engineers, and the Institute of Metals will be in session.

Papers will be read at the meetings of the American Society for Steel Treating by the following:

H. J. Alleman and H. F. Moore of the University of Illinois; James Aston, Carnegie Institute of Technology; A. H. d'Arcambal and H. J. Fishbeck, Pratt & Whitney Co., Hartford, Conn.; H. W. Dunbar and Mr. Beecher, Norton Co., Worcester, Mass.; George A. Dornin, Gathmann Engineering Co., Baltimore, Md.; B. H. DeLong, Carpenter Steel Co., Reading, Pa.; G. M. Eaton, Molybdenum Corporation of America, Pittsburgh; F. B. Foley, Midvale Co., Nicetown, Philadelphia; E. R. Frost, National Machinery Co., Tiffin, Ohio; H. J. French, Bureau of Standards, Washington;

H. M. German, Universal Steel Co., Bridgeville, Pa.; R. G. Guthrie, Peoples Gas Light & Coke Co., Chicago; Marcus A. Grossmann, Central Alloy Steel Corporation, Canton, Ohio; J. P. Gill, Vanadium Alloys Steel Co., Latrobe, Pa.; S. L. Hoyt, General Electric Co., Schenectady, N. Y.; Dr. Kotaro Honda and S. Muira, Imperial University, Sendai, Japan; H. M. Houston, International Nickel Co., New York; W. M. Hepburn, Surface Combustion Co., New York; W. H. Hatfield, Brown-Firth Research Laboratories, Sheffield, England; Dr. Benjt Kjerrman, S.K.F., Gothenburg, Sweden; Dr. V. N. Krivobok, Carnegie Institute of Technology; H. G. Keshian, Chase Metal Works, Waterbury, Conn.; George L. Kelley and Joseph Winlock, Philadelphia; W. M. Mitchell, Central Alloy Steel Corporation, Canton, Ohio; J. B. Mudge, Western Electric Co., Chicago; W. J. Merten, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; R. R. Moore, Dayton, Ohio; J. S. G. Primrose, Manchester, England; Richard Rim-bach, Bacharach Industrial Instrument Co., Pittsburgh; George Satterthwaite and H. B. Allen of Henry Disston & Sons, Inc., Philadelphia; Howard Scott, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Dr. Ancel St. John, New York; F. L. Wright, Atlas Ball Co., Philadelphia; W. H. White, Duquesne Steel Foundry Co., Coraopolis, Pa.; A. V. deForest, American Chain Co., Bridgeport, Conn.; Francis F. Lucas, Bell Telephone Laboratories, New York; C. H. Herty, Jr., Pittsburgh; E. J. Lowry, Hickman Williams Co., New York; E. C. Bain of Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.; and W. P. Sykes, General Electric Co., Cleveland.

Ohio Foundrymen Amend Trade Customs

The "uniform trade customs" worked out by the Ohio State Foundrymen's Association some years ago and looked upon as the correct code of relations between buyers and sellers of castings have been brought up to date to meet changing conditions. The revision is as follows:

UNIFORM TRADE CUSTOMS

As Adopted by

THE OHIO STATE FOUNDRYMEN'S ASSOCIATION

1. For estimating purposes, blueprints submitted must be marked with rough casting weight, if known, or an estimated weight upon which quotation will be based.
2. Patterns to be in condition to make castings of the quality and quantity required.
3. Correctness of patterns and core boxes to blueprints rests with customer.
4. If patterns require fallow boards or boards for molding equipment, they must be furnished by customer. On patterns requiring stopping off or if skeleton patterns are furnished, an extra charge will be made. Repairs and changes in patterns by customer's order at expense of customer. Patterns to be painted the following standard pattern colors:
Surfaces to be left unfinished are to be painted black.
Surfaces to be machined are to be painted red.
Seats of and for loose pieces are to be red stripes on a yellow background.
Core prints and seats for loose core prints are to be painted yellow.
Stop-offs are to be indicated by diagonal black stripes on a yellow base.
5. All patterns, core boxes and loose pieces thereof should be properly marked for identification.
6. All freight, drayage, boxing and crating on patterns to and from foundry at expense of customer.
7. Foundry not responsible for loss of or damage to patterns by fire or other casualties beyond its control.
8. Patterns not in use for a period of six months shall be subject to storage charges.
9. The foundry is responsible only to the extent of replacing castings rejected due to foundry defects, and such castings must be reported or returned to the maker within 90 days after shipment. The foundry is not responsible for labor charges, loss or damage caused by defective castings. In case of non-ferrous castings the full weight of the original castings rejected must be accounted for or returned to the manufacturer.
10. Claims for error in weight or number must be made within five days after receipt of casting.
11. All castings are sold as rough castings, f.o.b. foundry. Terms, 30 days net from date of invoice unless otherwise stated.
12. If the customer requires special production service to secure quick delivery, an extra charge shall be made.
13. No order shall be changed unless notice of revision is made in writing and received by foundry before the

work is in process. In case work is in process, customer to be charged with any castings made and cost of cores or molds discarded due to change in patterns or core boxes.

14. Foundry shall not be liable in damages for failure to deliver caused by fires, strikes, differences with employees, accidents, or other causes beyond its control.
15. Cancellation of orders are to be made only by mutual consent.
16. Unless otherwise agreed, quotations must be accepted and patterns furnished within 30 days from date of quotation.
17. Any quotation containing more than one class of work, or more than one itemized price, is furnished with the understanding that acceptance is for the entire lot.

The uniform trade customs were worked out as a means of assistance to the buyer and the seller of castings. They have been subscribed to in whole or in part by the following organizations: American Foundrymen's Association, American Institute of Mining and Metallurgical Engineers, American Malleable Castings Association, American Society for Testing Materials, Foundry Equipment Manufacturers' Association, National Association of Pattern Manufacturers, National Association of Purchasing Agents and Steel Founders' Society of America.

Holds Exhibit of Wood Working Machinery

The Wayne Machinery Co., Fort Wayne, Ind., is holding an exhibit at its showrooms in that city of ball-bearing, motorized equipment for working and finishing wood. The exhibit was opened Monday, June 27, and will be continued until July 2. More than 80 machines are being shown by the following manufacturers: Atlas Mfg. Co., Black Brothers Co., Beach Mfg. Co., Buffalo Forge Co., Howell Electric Motors Co., Heath Machine Co., Heston & Anderson, E. & B. Holmes Machinery Co., Hermance Machine Co., Irvington Machine Works, Jones-Superior Machine Co., Little Giant Co., Motor Appliance Co., R. D. Eaglesfield Co., Peerless Surfacing Machine Co., Samuel C. Rogers & Co., Ransom Mfg. Co., Sinkers-Davis Co., Sidney Machine Tool Co., Solem Machine Co., E. C. Tecktonius Mfg. Co., J. D. Wallace & Co.

The Cold-Rolled Strip Steel Institute, E. Theodore Sproull, commissioner, a scientific and research organization of manufacturers of cold-rolled strip steel, the forming of which was reported in THE IRON AGE May 19 last, has opened offices at 2132 Oliver Building, Pittsburgh.

Production and Export of Machinery

Europe Exports One-fourth of Output; United States One-tenth—American Proportion of World Exports Growing

OUTSTANDING in the papers presented before the engineering division of the recent International Economic Conference in Switzerland was one by the German Engineering Association, covering machinery. It formed an attempt to evaluate the world production, world capacity and world exports of machinery in 1913 and 1925, or as near 1925 as complete figures could be had.

As covered in our tables and diagram, the producing countries are given as United States, Great Britain, Germany and all other. The "all other" group is about in line, so far as size goes, with Great Britain and Germany. Figures given in the tables represent millions of gold marks on pre-war prices, the 1925 returns being affected by a price index.

According to the figures, the United States in 1913 produced almost precisely half the entire world output. In 1925, American production had increased by 25 per cent in the 12 years, while the output of the other countries as a group declined 8 per cent. German production showed a shrinkage of one-third and that of countries outside the three large producers a decline of 7 per cent. Great Britain, on the other hand, showed a gain of 25 per cent, thus holding about the same relation with the United States in 1925 as in 1913.

Proportion of Output Exported

Both years the United States exported almost precisely one-tenth of her production. Great Britain exported 45 per cent of her output in 1913 and about 30 per cent in 1925. German exports were close to 26 per cent of output in each year. The other countries exported nearly 17 per cent of their production in 1913 and more than 22 per cent in 1925. Domestic consumption of machinery was a greater factor in 1925

than in 1913, not only in Great Britain and in Germany, but in the world at large.

From the chart it will be noted graphically that Great Britain's machinery, made for her own use, in 1913 was scarcely more than half of her total production, against 90 per cent in the United States. Despite the fact that the United States has advanced from third rank as an exporter in 1913 to the leading position in 1925, the American people still absorb nine-tenths of their huge machinery production. And disregarding imports, which would swell the proportion, the United States absorbs more than half of the entire world output.

Table II shows the ten principal markets for machinery, of the three great producing nations, both for 1913 and for 1924. In all cases, these ten leading markets absorbed more than half the total exports of the respective exporting countries. The fact that a blank appears opposite a destination in any column of the table does not indicate that exports of machinery were not sent to that country. It means only that that country was not, that year, among the ten leading customers of the supplying country.

From this table it will be noted that the United States has had things pretty much its own way in North America and the West Indies. We have made heavy gains in Argentina, but in Brazil have lost ground to Germany. Great expansion in our exports to Australia and Japan has been accompanied by similar but less marked British expansion.

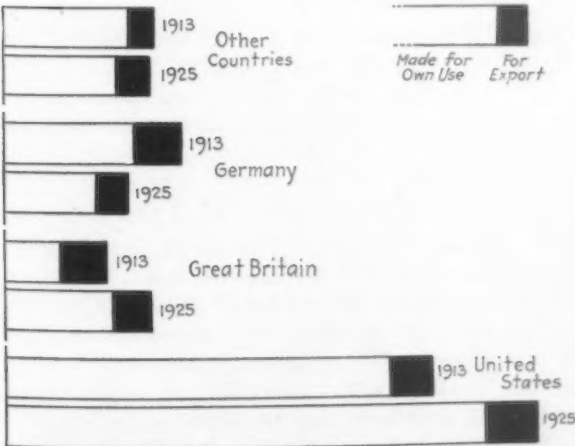
Our machinery has invaded Great Britain to an increasing degree, partly displacing German machinery. The same is true of France. For the remainder of the European states, however, Germany has a long lead on both Great Britain and the United States.

Table I.—World Production and Exports of Machinery
(In Millions of Gold Marks)

	1913			1925 (a)		
	Output Total	Per Cent of World	Exports Total	Output Total	Per Cent of World	Exports Total
United States	6,775	50.0	680.6	8,465	57.6	853.2
Great Britain	1,602	11.8	721.3	2,007	13.6	598.8
Germany	2,800	20.6	738.4	1,933	13.1	489.9
Other countries	2,378	17.6	396.9	2,300	15.7	508.3
World	13,555	100.0	2,537.2	14,705	100.0	2,450.2

(a) At pre-war prices.

(b) Of which 100 relates to territory no longer in Germany.



Machinery Produced Is Shown by Full Length of Each "Strip." The black portion was exported; that remaining white was absorbed by country of production

Table II.—Exports of Machinery to Ten Largest Customers
(In Millions of Gold Marks)

	From United States		From Great Britain		From Germany	
	1913	1924	1913	1924	1913	1924
Canada	145.9	158.6	...	...	...	...
Mexico	26.6	59.9	...	...	...	...
Cuba	18.1	56.4	...	...	...	...
Argentina	19.6	105.2	34.7	24.4	...	29.6
Brazil	30.7	28.4	25.9	28.9	24.8	43.9
Australia	19.2	52.6	43.6	58.1	...	...
Japan	15.5	59.5	33.9	51.0	...	...
China	...	...	...	22.0	...	...
India	...	...	102.1	186.3	...	...
South Africa	...	22.4	28.9	38.2	...	...
Great Britain	68.5	103.2	0	0	39.9	33.3
France	20.5	70.4	45.6	53.8	74.6	...
Russia	19.9	...	77.7	...	136.5	39.9
Belgium	...	...	21.3	27.1	37.1	...
Netherlands	...	...	19.9	...	35.0	48.1
Spain	...	...	...	22.4	26.0	34.7
Austria	...	...	...	...	84.4	...
Italy	...	...	...	...	39.2	59.9
Switzerland	...	...	...	...	25.6	28.7
Poland	...	...	...	...	...	34.2
Sweden	...	...	...	...	...	28.7
Total of ten	384.5	719.2	433.6	512.2	523.1	381.6
Percentage of total exports	57	71	60	67	72	52

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Steel Prices Need Watching

THE unfavorable turn steel demand has taken lately adds emphasis to the situation that was clearly visible at the beginning of the year—a situation that called on producers of steel to watch their prices closely. Circumstances have been such that a loss in the price level could scarcely be regained except through some particularly favorable developments. The conditions are altogether different from those which used to obtain, when declines were naturally followed by upward reactions, and vice versa.

In September or October of last year demand for steel took an unfavorable turn. It required careful study to discern that something was occurring that was not due either to the season of the year or to some passing influence. When this year got well under way there were some indications of general improvement, but the more recent news tends to support forecasts made in December, that this year would be slightly off from last year in point of tonnage, possibly up to 10 per cent. For several years the steel trade had doubted whether the tonnage it was enjoying was more likely to change to a bulge or a depression. Now the chances of a bulge are seen to be quite problematical.

It is testimony to the steadiness of demand in recent years, but a striking fact, nevertheless, that a decline of only 6½ per cent in steel production this year from last year would make the year's total just equal to that of 1923, when ingot output was 43,485,665 tons. The three intermediate years, 1924, 1925 and 1926, with 1924 an off year, averaged just 2 per cent under this amount. Obviously the producers ought to lay their plans on a basis of getting along with approximately this tonnage; and with no substantial increase in tonnage demand in four years, closer watching is requisite because there has been some new construction and old plants do better in tonnage through practice and the making of minor improvements.

Well maintained as it has been, the profits on the turnover have been very small. The steel in-

dustry requires at least two years to turn over its capital through sales of its finished product, on the basis of last year's output. One of its largest customers, the automobile industry, takes less than six months to turn over its investment. The case is selected chiefly because data have recently been published by the National Automobile Chamber of Commerce.

The distribution of steel demand to the different producers has been quite uniform, indicating that there is no substantial reason for aggressive price concessions. There has been strenuous competition in sales, but it has very largely taken other forms than that of price cutting, and the results speak for themselves. Buyers have been educated more and more to consider the value of quality and service. There is room for producers to continue improving their methods and to practice intelligent salesmanship to make these improvements count in retaining their trade. Furthermore, there has been of late increasing recognition on the part of steel buyers that their sources of supply need to be protected by being given orders and at prices that involve a decent profit.

The Testing Society's 25 Years

DREAMS sometimes come true—even beyond the visions of the dreamers. In 1902 a small group of men—dreamers, some called them—started an organization which today ranks among the highest in engineering accomplishment and prestige. Last week it celebrated its twenty-fifth anniversary.

From a membership at the end of the first year of only 175, the American Society for Testing Materials has advanced steadily and today has more than 4200 individual and corporate names on its roll. Starting with only a few standing committees, there are now close to 50, which have prepared for industries dealing with materials of engineering nearly 500 standard and tentative specifications. Makers, users and consulting engineers—these last often becoming arbiters between conflicting interests—have worked together in the framing of standards whose influence has been far reaching. In so

contributing to higher quality and to longer life of materials of construction, the society has made a place for itself as a great conservator of resources and an economizer of human energy.

In the earlier meetings at Atlantic City there were battles royal over steel rails, boiler steel, corrosion and other issues, and in not a few committee sessions controversy ran high. But time and technical progress brought the contenders to common ground and militant years were followed by a period of abundant labors in technical research. The results of these investigations are seen in various fields, notably in corrosion, in preservative coatings, in magnetic analysis and in fatigue testing.

The American Society for Testing Materials is the work of many builders; but there will be no hesitancy among those who knew its beginnings in naming two men who did most to make its life secure—Dr. Charles B. Dudley, president from 1902 until his death in 1909, and Prof. Edgar Marburg, who was its secretary for 16 years up to his death in 1918. Doctor Dudley's remarkable presidential addresses on the philosophical and technical sides of the testing engineer's work were classics in testing literature, and his rare ability to draw out discussion was the making of many a technical session. Doctor Marburg came to the secretaryship inheriting the results of the controversial episodes which were the death of the American branch of the International Association for Testing Materials, and all his enterprise and devotion and his rare talent for organization were needed in the years of rebuilding. Both men have had worthy successors, but to these two engineering is peculiarly indebted for broadening the society's service to American industry far beyond the largest thought of the founders.

Lines Penned in Exhaustion

IF the United States were ruled by a benevolent despot, no doubt he would issue a ukase making it a crime punishable by boiling in oil to schedule more than three technical papers in a single session. And for this most salutary law, his despotism would justify itself forever.

But it avails not to pine for this Arcadia; it is certain such a law could never be enforced. Next month, next year, will be more meetings of exhausting length. The only consolation is that there is no law compelling the members of the afflicted societies to sit through them from end to end.

Nor do they.

One suggestion (for this is bad for both society and member): Now that the study of fatigue in metals is so stylish, why not extend the investigations to the no less important realm of fatigue of audiences? It should be possible to determine the endurance limit of selected samples of humanity under various conditions of humidity, temperature, monotony and proximity to golf course, board walk or (sand) bar. Given these needed fundamental data, a secretary could proceed to design programs unlikely to injure the gathering. Such a research could be generously financed at the close of any elongated session.

Pending the accumulation of such design data, some mistakes will continue to be made. Seven items on the agenda allotted 15 minutes each will unaccountably stretch to three hours. To avoid or at least mitigate the attendant physical suffering,

the sale of cushions at the door might prove efficient (pop bottles, however, we do not favor). Or there might be a "7th-inning stretch." Or the happy cricketing custom of recessing for tea might be imported. It would be well worth any customs duties assessed.

Other plans might easily be devised. But something should be done and that quickly, if only to save our societies from their programs.

Steel Yield from the Ingot

ROLLED and finished steel last year had a tonnage 74.18 per cent as great as that for ingots. This is about the average (74.14) of the six years 1921-26, and is a little above the 73.99 per cent of 1925. Nevertheless, the ratio, considered over a period of some years, is dwindling. In 1914 and for ten years before that it was each year above 75, and only once since then (1920, with 75.62 per cent) has it reached that figure.

Mathematically analyzed over the period of 16 years—1911 to 1926 inclusive—the straight trend line enters 1911 at 75.63 per cent and reaches mid-1927 at 73.88 per cent. On that basis 1926 was a little above a theoretical "normal."

The heavy cropping of ingots required by rigid specifications and inspection during the war brought the 1917-18-19 average down to about 70.50 per cent. The rebound in 1920 may be attributed to the pressure for deliveries, duplication of orders and easier acceptance of steel than in times of less eager demand.

That the generally lower ratio of the present, compared with pre-war, will be permanent may be inferred from the greater proportion now of lightweight items, such as sheets, strips and pipe. These absorbed nearly 36 per cent of the total 1926 tonnage, against about 25 per cent 15 years earlier. Increased scale losses through a larger number of heatings and a greater area exposed to oxidation for each ton heated, as well as higher cropping losses due to more rollings, would tend toward a lower yield from the ingot.

Welded Steel or Castings?

OF major importance is the account in this issue of fabricating operations on large motors and generators at General Electric's Schenectady plant. It will doubtless be hailed with enthusiasm by the advocates of welding. On the other hand, it merits the most careful study by manufacturers of heavy iron or steel castings.

The question, "Shall we make a casting or weld the part in steel?" will arise more frequently in the future. It has been answered in favor of welded steel at Schenectady to such an extent that castings weighing a ton or more are now a matter for remark.

The advantages of the new method are: It uses the more homogeneous metal and thus insures more uniform magnetic characteristics; it enables the designer to make frames to suit the electrical requirements, rather than scheme out coils and wiring to fit an existing pattern; it saves weight; it utilizes standard materials and much automatic machinery; the welding operation requires only a brief training period and is attracting a high class of mechanic; it consumes less

time between the design and delivery of the finished piece and consequently economizes on floor space; welded parts require no patterns.

This is an imposing array of advantages, indeed. Counterbalancing them, the foundry can present: ability to make the more complicated forms; better external appearance by the use of rounded surfaces and generous fillets; a cheaper metal for massive parts to absorb vibrations and shocks; a reputation for reliability centuries old; lower drafting room costs.

Aside from the purely electrical considerations, it appears that conditions favoring welding at Schenectady arise from the fact that most of the big machinery is special—"tailor made" by twos and threes, thus requiring excessive pattern costs; yet the parts themselves are not especially complex in their essential requirements and are materially lighter in the new form. Then, too, electric welding cannot but be an attractive manufacturing method for an electrical company.

Such a combination of factors would probably prove too much for any jobbing foundry. The problem is, Does it mark the arrival of a new competition which the iron foundry must prepare to meet? In our opinion it does.

It will not be sufficient to call attention to the fact that the change from a casting to a welding will require a new design, and if the same amount of brains is expended on designing for casting as must be used in designing for welding, large economies may also be effected in the foundry. The same observation could be made as truly about redesigning parts for forgings, stampings, die castings, or non-metallic compositions; yet that has not prevented each of these substitutes from encroaching deeply into the field once occupied by cast iron. Collectively they have been responsible for the stationary volume of output by the iron founding industry during the last decade, despite the increase in metallic manufacturing generally.

Obviously foundries will continue in business. For many classes of work they can easily hold their own against welding. Large or small articles of intricate shape, with rounded, domed or irregular surfaces, produced in such quantities that the shop can adequately tool the job with molding machines, conveyors and other labor-saving devices, and then operate these tools *continuously*—for such the iron foundry will be hard to beat. But those pieces which are ordered only by twos or threes, or even twenties and thirties, molded by hand in loam or on the floor, where the pattern expense per piece is high, where the loss of a single casting from a misrun or other accident means the difference between profit and loss—these the foundries will have difficulty in retaining.

Probably the controlling factor will be personnel. Welding, being a new trade with a certain dramatic aura, is attracting keen young engineers and mechanics. Compared with the years of apprenticeship now required before a molder can call himself a journeyman, a couple of months will make a welder who can equal in wages almost anything the foundry has to offer. It results that the foundry industry generally has been faced with a serious labor problem, by no means helpful in maintaining morale and efficiency.

We have heard of a definite influx of young technical graduates into the foundry during the last few years. They will be much needed. They will have to face this competition with fabricated steel. They will do it by developing high-strength irons, perhaps heat-treated semi-steel, as strong as mild steel, and then use this to full advantage in castings especially designed for economical production. They will analyze minute time studies and, knowing all elements of cost, will be brave enough to refuse work on which a reasonable profit cannot be made. They will banish the mystery from the molder's trade and turn young men into molders before they are too old to profit by their training.

This may appear to be an overwhelming task for an industry. But it is well to repeat that it is largely a matter of personnel. It will require organization and selling; it will require some education and some ousting, not alone of the foundry executives but of the foundries' customers; and it will involve some sharp labor controversies. But industrial conditions are changing at a speed never before attained, and in order to survive every industry must adapt itself to meet the new conditions or it will be lost.

Our Excessive Production

THERE appears an increasing note of pessimism in our business, which is undoubtedly a reflection of the continuance of low prices for many commodities, and a shrinkage in or disappearance of margins of profit. This is the situation in so many industries that those in which prices are rising are the exceptions.

It is probably true that this situation does not so much reflect recession in consumption as excessive production, or known ability to increase production rapidly. There is no marked unemployment except in spots where there are special causes; for example, in the unionized bituminous coal mining centers, in some of the textile towns in New England, and in some of the shoe manufacturing towns of the same region. So long as general employment continues so good it is to be expected that the demand for consumption goods, and the ability to satisfy it, will continue on a large scale. An illustration is found in the petroleum industry, wherein the consumption of gasoline is unprecedented, but the production of crude oil has increased in even greater proportion.

After all, there is nothing but low prices and narrow margins that will keep conditions in balance. This does not mean that prices must continue quite so low as at present, for some time is always required for producers to make readjustments, and even to become aware of how much they are losing when all things are considered. This is one of the most difficult of all problems in industrial management.

Academic economists teach us that there is no such thing as overproduction, that the more goods produced the more does the world's population benefit. In the abstract this is undeniable, and in the long run undoubtedly true. But at any given period production, or production capacity, may be out of balance, and no economist tells us how to correct such maladjustments.

Petroleum production is excessive by reason of the progress in science and art.

The women of the country curtail their clothing and raise the dickens with the textile industry.

Many thousands of bituminous coal miners are idle for the sake of the Jacksonville scale, while non-union miners are producing all the coal we need.

Theoretically a great many men from these industries and others should be diverted to other kinds of production, affording us things we need.

We need more houses and cheaper rents, more and better urban and suburban transportation. Soon we shall need more railroads, for with increasing population the capacity of existing trunk lines is some day going to be insufficient. As a generalization, for the moment we need things that will reduce the cost of living. If we have ample of goods, which appears to be the case, what we need is more of services. The migration of labor from

the farms to the towns has not yet apparently ameliorated this. The increasing absorption of labor for governmental purposes, such as road building, does not help the situation at all, but rather makes it worse.

Labor released from one occupation may be reluctant to enter another or be unfitted immediately to do so. Many women are needed in domestic service, but factory girls have neither the training nor liking for that. No doubt there are many men idling in the vicinity of coal mines who could serve many purposes in the towns, and some might even learn to become bricklayers, carpenters, painters and artisans of other sorts; but whatever might be their disposition and ability the unions would not allow them. We might almost think that some day there will be such competition among labor as to develop a hunting for jobs, just as competition among producers has created a searching for orders.

Lake Superior Iron Ore Shipments by Years and Mine Directory

A fresh contribution to the valuable service of the Lake Superior Iron Ore Association, Union Trust Building, Cleveland, is a directory of mines and operators on the Lake Superior ranges. There are 10 pages of photo-reproduced data sheets, giving lists of officers and engineers, of mining companies, location of mines, with method of mining, and an indication of the active or inactive status of each property. Eight pages follow giving shipments from each mine by years, list of inactive mines, shipments by ranges, receipts at Lake Erie and other lake ports, ore on dock May 1 and Dec. 1, also annual shipments of iron ores in the United States from other than Lake Superior mines, and our annual imports of iron ore by countries of origin for the years 1907 to 1926, inclusive.

New England Iron and Hardware Association Holds Annual Meeting

At the annual meeting of the New England Iron and Hardware Association, held Tuesday evening, June 21, at the New Parker House, Boston, the retiring officers and directors were reelected. William A. Hopkins, Decatur & Hopkins Co., Boston, is president; Franklin E. Bragg, N. H. Bragg & Sons, Bangor Me., vice-president; and George J. Mulhall, treasurer. Mr. Mulhall also is secretary of the organization.

The board of directors, in addition to the president and vice-president, includes: C. D. Alexander, Emery Waterhouse Co., Portland, Me.; G. M. Congdon, Congdon & Carpenter Co., Providence, R. I.; M. B. Damon, Fitchburg Hardware Co., Fitchburg, Mass.; C. C. Dodge, George F. Blake, Jr., & Co., Worcester, Mass.; Charles A. Adams, J. B. Varick Co., Manchester, N. H.; R. H. Sanderson and C. W. Henderson, Jr., E. P. Sanderson & Co., and George M. Gray, Peter Gray & Sons, Cambridge, Mass.; R. M. Boutwell, Standard Horse Shoe Co., F. Marsena Butts, Butts & Ordway Co., Q. W. Wales, Brown & Wales Co., and Frank F. Chase, Chase, Parker & Co., Boston.

Reports submitted by the various committees and officers for ratification disclosed that the association

is in a sound financial condition and gaining in membership. Members spoke optimistically of the general business outlook in New England, but it was the opinion of most of those present that a protracted spell of warm weather will materially help the sale of all classes of hardware, iron and steel.

Micrometer Measures Distance Between Layers of Atoms

A micrometer measuring the distance between layers of atoms in crystals is being used in X-ray studies which, it is asserted by chemists, promise to create a new sphere of knowledge in metals and profoundly influence industry.

"These distances are so small that it is hard to imagine them," says the announcement of the researches by the Institute of Chemistry, which was recently founded by the American Chemical Society, and will hold at Pennsylvania State College in July an international forum. "The distances range from five to ten thousand-millionths of an inch, yet the new micrometer measures each spacing with such accuracy that the final answer is accurate to a hundred thousand-millionth of an inch."

This is the kind of apparatus, developed by means of the X-ray at the research laboratory of the General Electric Co., Schenectady, N. Y., which, according to the announcement, is being utilized in the studies, now under way at the college under the direction of Dr. W. P. Davey, of the General Electric Co., who has been appointed to direct institute courses in X-rays and crystal structure.

Ohio Sheet Mill Merger Up Again

CLEVELAND, June 28.—Plans to merge a number of Ohio sheet mills have been revived. The mills involved are about the same as those that considered joining in the merger proposed several weeks ago but which fell through. The present merger negotiations are being conducted by interests that had no part in the previous efforts.

Schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, follows: July 14—Activity in Steel Consuming Industries; July 21—Position of Iron and Steel Producers; July 28—General Business Outlook.

Iron and Steel Markets

Industry Facing Summer Quiet

Present Rate of Buying Likely to Hold Until September—
Strong Efforts to Stabilize Prices—Further Reductions
in Pig Iron—Coke Higher

ALL indications are that the summer will be quiet, especially in contrast with the expanding demand which was in evidence this time a year ago, and that only the barest needs will be covered through the next two months. However, the bookings of the last few weeks have been of that order, and so no pronounced dip is expected in buying, although the swing in production may be carried further downward.

The first six months in output will prove to be close to the record performance of the first half of last year, in spite of the week's further curtailment. Ingot output is put at 65 per cent of capacity in the Pittsburgh district and at 75 per cent at Chicago, where another Steel Corporation blast furnace has been blown out.

In the automobile trade a normal taking of steel for the period is looked for, in spite of checks incident to bringing out new models by the large builders. The continued high production of oil is bringing fresh inquiries for plates for oil tanks. Plant vacation movements find encouragement in situations like the present, and the growing practice may find more than the usual number of steel consumers shut down for a two weeks' period.

Price advances of \$1 a ton have been widely posted on forward business in wire nails, staples and barbed wire, and have served to stimulate contracting at the present market level. With the success makers have won in a like movement in sheets, producers of sheet bars are seeking a raise of \$1, as are wire rod makers.

In bars, plates and shapes, third quarter covering is decidedly limited. While there are still notable irregularities, unusual efforts are being made to stabilize these heavy tonnage products at a 1.80c., Pittsburgh, basis. The Pennsylvania Railroad, on third quarter needs, including 18,000 tons of plates, received bids of 1.80c., mill.

Bar mills, which turn out nearly 20 per cent of the country's finished steel, are now operating at about 60 per cent of capacity. Pipe mills are producing at a 75 per cent rate, though pipe shipments for the first half of the year fell 10 per cent under those for the same period last year, partly from a drop in standard weight pipe as well as in oil well drive pipe, pipe line construction alone holding up.

Shipments of sheets for the half year were not 4 per cent less than a year ago, and sheet mills are operating at 80 to 85 per cent, with delivery promises of ten days to two or three weeks. Tin plate mills lost little ground, in the comparison with last year, but operations are not over 75 per cent and the backlogs of orders are not large.

Prices of alloy steel have been reduced about \$2 a ton on most grades for which there is the largest

call, and July releases against specifications will be billed at the lower prices. Shipments are in excess of orders.

Foundry pig iron has declined 50c. a ton at Buffalo and eastern Pennsylvania furnaces on a few purchases of round tonnages for third quarter. A similar reduction on basic iron in the Valleys is ascribed to increased pressure for business by steel company furnaces with surplus production. Lake Erie furnaces have dipped to \$17.25, Cleveland, on orders for foundry iron taken in southwestern Ohio. Foundry operations are spotty, with the trend toward curtailment. The American Radiator Co. has bought 20,000 tons of iron for third quarter delivery, chiefly for its Western plants.

Spot furnace coke has advanced 10c. a ton to \$3, Connellsville, as a result of curtailed production. Failure of central Pennsylvania coal operators to reach an agreement with the miners' union for a reduction from the Jacksonville scale means that mines in that region will shut down July 1. Accordingly, Connellsville coke producers expect to find a more profitable market in coal than in coke.

Spiegeleisen has declined \$2 to \$34 a ton, furnace, as a consequence of increased domestic competition and a falling off in specifications against contracts.

With structural steel contracts for the week of 35,000 tons, the total for the second quarter, as reported to THE IRON AGE, is 431,000 tons, compared with 470,000 tons in the first quarter. The week's business includes 7000 tons for an office and bank building in Detroit and 5000 tons for a telephone building in Newark, N. J.

The Lehigh Valley is inquiring for 1000 freight cars and the Chicago & North Western for 500. The Lehigh & New England ordered 200.

Exports of iron and steel in May, at 202,718 tons, made the highest total since January, showing a gain of 10,369 tons over April and of 28,440 tons over May, 1926. For the first five months, exports were 9 per cent above last year, with 947,504 tons against 869,099 tons.

While iron and steel imports in May advanced to 79,814 tons, against 60,374 tons in April, there was a sharp decline in the total for the first five months. The drop was 36 per cent, from 488,759 tons to 314,915 tons. An increase in pig iron accounted for nearly half the month's increase, wrought pipe showing, also, a heavy gain.

THE IRON AGE pig iron composite price is now lower, except for eight months in 1921 and early 1922, than any time since the fall of 1916. It has dropped to \$18.71, from \$18.96 last week, and is \$1 below its level Jan. 1. The finished steel composite price remains at 2.367c. a lb. for the third week.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	June 28, 1927	June 21, 1927	May 31, 1927	June 29, 1926
No. 2, fdy., Philadelphia...	\$21.26	\$21.76	\$21.76	\$22.26
No. 2, Valley furnace....	18.00	18.00	18.50	17.75
No. 2, Southern, Cin'ti....	21.69	21.69	21.69	24.19
No. 2, Birmingham	18.00	18.00	18.00	21.00
No. 2 foundry, Chicago*...	20.00	20.00	20.00	21.00
Basic, del'd eastern Pa....	20.75	20.75	20.75	21.25
Basic, Valley furnace....	17.50	18.00	18.00	18.00
Valley Bessemer, del. P'gh	20.26	20.76	20.76	20.76
Malleable, Chicago*	20.00	20.00	20.00	21.00
Malleable, Valley	18.00	18.00	18.50	17.76
Gray forge, Pittsburgh....	19.26	19.26	19.76	19.01
L. S. charcoal, Chicago....	27.04	27.04	27.04	29.04
Ferromanganese, furnace..	90.00	90.00	90.00	88.00

Rails, Billets, etc., Per Gross Ton:

O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh..	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh...	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh.....	33.50	33.50	33.50	36.00
Forging billets, P'gh.....	39.00	39.00	39.00	40.00
O.-h. billets, Phila.....	38.30	39.30	39.30	40.30
Wire rods, Pittsburgh....	42.00	42.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90

Finished Iron and Steel,

Per Lb. to Large Buggers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh....	1.80	1.80	1.85	2.00
Steel bars, Chicago.....	2.00	2.00	2.00	2.10
Steel bars, New York....	2.14	2.14	2.19	2.34
Tank plates, Pittsburgh...	1.80	1.80	1.80	1.90
Tank plates, Chicago.....	2.00	2.00	2.00	2.10
Tank plates, New York....	2.09	2.09	2.14	2.24
Beams, Pittsburgh.....	1.80	1.80	1.80	2.00
Beams, Chicago	2.00	2.00	2.00	2.10
Beams, New York.....	2.04	2.04	2.14	2.34
Steel hoops, Pittsburgh....	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	June 28, 1927	June 21, 1927	May 31, 1927	June 29, 1926
Per Lb. to Large Buggers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	2.95
Sheets, black, No. 24, Chi-				
cago dist. mill.....	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	3.80
Sheets, galv., No. 24, Chi-				
cago dist. mill.....	3.95	3.95	3.95	3.95
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.30
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.....	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh....	2.50	2.50	2.50	2.65
Wire nails, Chicago dist.				
mill	2.55	2.55	2.55	2.70
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist.				
mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh...	3.20	3.20	3.20	3.35
Barbed wire, galv., Chi-				
cago dist. mill.....	3.25	3.25	3.25	3.40
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:

Heavy melting steel, P'gh.	\$14.75	\$14.75	\$15.00	\$16.25
Heavy melting steel, Phila.	14.00	14.00	14.00	15.00
Heavy melting steel, Ch'go	12.00	12.00	12.25	13.50
Carwheels, Chicago	13.50	13.50	13.75	16.00
Carwheels, Philadelphia ..	15.00	15.50	16.00	17.00
No. 1 cast, Pittsburgh....	15.00	15.00	15.50	15.50
No. 1 cast, Philadelphia..	16.00	16.00	16.50	17.00
No. 1 cast, Ch'go (net ton)	14.50	14.50	15.00	16.75
No. 1 RR. wrot, Phila....	16.00	16.00	16.50	16.50
No. 1 RR. wrot, Ch'go (net)	11.00	11.00	11.00	13.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt....	\$3.00	\$2.90	\$2.90	\$2.75
Foundry coke, prompt....	4.00	4.00	4.00	4.00

Metals,

Per Lb. to Large Buggers:	Cents	Cents	Cents	Cents
Lake copper, New York...	12.62 1/2	12.62 1/2	12.75	14.00
Electrolytic copper, refinery	12.37 1/2	12.25	12.37 1/2	13.62 1/2
Zinc, St. Louis.....	6.22 1/2	6.20	6.07 1/2	7.17 1/2
Zinc, New York.....	6.57 1/2	6.55	6.42 1/2	7.52 1/2
Lead, St. Louis.....	6.15	6.10	6.02 1/2	8.00
Lead, New York.....	6.40	6.40	6.27 1/2	8.25
Tin (Strait), New York..	66.00	67.37 1/2	67.00	61.62 1/2
Antimony (Asiatic), N. Y.	12.25	12.50	13.25	13.50

Pittsburgh

Ingot Output and Shipments of Finished Steel in First Half Lower Than in 1926

PITTSBURGH, June 28.—The steel market is still quiet, although a slight swell in specifications, such as is common to the last week of each month, leads most manufacturers to describe the past seven days as somewhat better than the week before. Wire manufacturers have begun to stiffen their quotations on nails and other wire products in which there had been recessions from the regular schedule, and it is probable that this step has stimulated contracting at the recent prices. But specific instances of quickening in demand are otherwise lacking, and it is probable that the gain in orders is ascribable to the fact that buyers have been placing their early July requirements rather than to a deviation from the progressively downward tendency of buying in the past few weeks.

It is natural for the trade at this particular time to review results of the first half of the year, and the canvass is fairly favorable as compared with the same period last year. Ingot production was almost equal to that of a year ago up to the end of May, but it is estimated that for the six months it will be all of 5 per cent smaller than a year ago, since the dropping off in output has been sharper this month than it was in June last year.

Shipments of finished steel products, according to present estimates, show an even greater decrease than the production of crude steel. The total shipments of pipe for the half year have run about 10 per cent behind those of last year, the large orders for pipe lines not having compensated fully for the loss of oil well

pipe tonnage incident to decreased drilling and the smaller demand for standard-weight pipe. Shipments of sheets have declined about 4 per cent as compared with a year ago, and shipments of tin plate in contrast with production over the first six months of the year, which showed a slight gain, have been somewhat less than in the first half of last year. Wire products, measured by shipments, have lost a little ground compared with last year.

Ingot production in this and nearby districts is holding at around 65 per cent of capacity, but the situation does not yet give signs of having reached bottom. Few expect that there will be much business from the automotive industry during the next 30 days. Since no small part of the oil country pipe shipped during the early part of the year still is unused as a result of the enforced curtailment of drilling, it is now commonly believed that not much business can be expected in that product over the remainder of the year. Backwardness of the season is not viewed cheerfully by those engaged in the manufacture of goods for the farmers and is likely to have some effect upon the demand for tin plate, since smaller crops will mean that some of the first half production will be available for third quarter requirements.

Except for the stiffening in nails, staples and barbed wire, the steel price situation is unchanged. Structural shapes are weak, and makers find it hard to get more than 1.80c., base Pittsburgh, on the ordinary tonnages. Sheets and strips are holding their advances.

The steel-making grades of pig iron have swung into line with the foundry grades with a decline of 50c. a ton, and real strength still is lacking in scrap. The coke market, however, is firmer. This is ascribable to a cut in production rather than to a materially better demand.

Pig Iron.—This market is weaker and lower on the steel-making grades, largely as a result of competition by the steel companies with surplus production. One steel company, which has the same rate of freight to Pittsburgh as the Valley furnaces, took 1000 tons of Bessemer iron for shipment to a Pittsburgh maker of steel mill equipment at \$18.50, furnace, and Valley producers are now finding it necessary to meet that price to get business. A Pittsburgh district steel company with a freight rate to Pittsburgh destinations of at least 50c. a ton under that from Valley furnaces has taken business in basic iron at \$17, furnace. It is out of the question that Valley furnaces can now obtain more than \$17.50, or \$19.26, delivered Pittsburgh, in the face of delivered prices well under that from nearby furnaces. The market appears to be fairly steady at \$18, Valley furnace, for No. 2 foundry and for malleable iron, and a fair amount of business has been done at that price. The sales include 1900 tons of No. 3 foundry at \$17.50, Valley furnace, and a Youngstown foundry bought 1000 tons of No. 2 iron for last half shipment at \$18. These prices do not just now represent the extreme minimum on foundry iron, as there is about 3000 tons of foundry iron in the stock of the Clinton Iron & Steel Co., the property of which recently was sold to the Pittsburgh & Lake Erie Railroad, that former owners are rather anxious to move and have offered at \$17.50, Valley furnace basis.

Prices per gross ton, f.o.b. Valley furnace:

Basic	\$17.50
Bessemer	18.50
Gray forge	17.50
No. 2 foundry	18.00
No. 3 foundry	17.50
Malleable	18.00
Low phosphorus, copper free.....	\$27.50 to 28.00

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

Warehouse Business.—No change has been made in the regular warehouse prices, but concessions are fairly common on plates, shapes and bars, notably bars, on which as low as 2.60c. has been done, as compared with the regular price of 2.90c.

Ferroalloys.—Spiegeleisen is weaker and on carload lots \$34, furnace, now appears to be the maximum going price on 19 to 21 per cent material, as compared with recent quotations of \$36 to \$37. There is more than one maker of this alloy and lately one producer has been quoting \$34 for small lots. No other course but to meet that price has been open to the other, since some falling off in specifications on contracts has left a rather good supply of material available for spot buyers. The steel companies are not specifying with much freedom against contracts for ferromanganese, and shipping instructions on commitments of high grade ferrosilicon are fewer and smaller than they were recently. These alloys are holding at recent prices.

Semi-Finished Steel.—There is not enough business to test prices on billets, slabs and sheet bars. Non-integrated manufacturers either have fair-sized stocks or expect little or no difficulty in securing supplies when and as they are needed. Nominally, the market is quotable at \$33, Pittsburgh or Youngstown, on large billets and slabs, with 50c. per ton additional asked for the smaller sizes and for sheet bars. In keeping with the effort to restore early February prices on nails,

staples and barbed wire, which means \$1 a ton advance in those lines from their recent selling prices, manufacturers also have announced \$43, base Pittsburgh or Cleveland, as the basis of new business in wire rods. Skelp is still slow, and the decline in automobile production has lessened the demand for forging quality billets.

Wire Products.—A number of manufacturers have announced the withdrawal of the prices at which they have recently been taking business in nails, staples and barbed wire, and effective June 27, have instructed their salesmen that new business must be on the basis of the early February schedule of \$2.55 per keg, base Pittsburgh or Cleveland, on nails, an advance of \$1 a ton. Bright or manufacturers' wire remains as \$2.40, base, per 100 lb., Pittsburgh or Cleveland. No change is made in the price differentials between Pittsburgh and other producing centers. The stronger price stand does not appear to be due to larger demands, but rather to the fact that producers have found costs too high in relation to recent selling prices, which, incidentally, have not stimulated buying to a point of permitting cost reductions through increased plant operation.

Rails and Track Supplies.—Actual business in these lines is still light, and there is some question whether the recent inquiry of the Pennsylvania Railroad for 50,000 tons of standard-section rails does not include some of the 180,000 tons ordered last fall, which was not specified. The Norfolk & Western is expected to put out its last half inquiry in the next week or two; last year, the inquiry was for 60,000 tons. Light-section rails are dull, but prices are holding, as they are on other items under this heading.

Tubular Goods.—Total shipments of pipe for the first half of the year have not been much smaller than for the same period last year, but the showing for the entire year is likely to make an unfavorable comparison with 1926. The most active period of last year was from about the first of March until the first of November, and the hope is growing dimmer that the remainder of this year will show as much activity as did that period last year. The record for the first half of this year has been materially helped by some large gas pipe-line business. Shipments of standard-weight pipe have been approximately 10 per cent smaller than a year ago, and business in oil country pipe has not amounted to much after a good first quarter movement. The overproduction of oil, largely due to the heavy output of the Seminole, Okla., field, made necessary a restriction of drilling, and much of the pipe shipped for that purpose in the first quarter of the year either has remained unused or has been shipped to points where it could be used. Negotiations are reported as being in progress for the settlement of the details in connection with the gas line from Amarillo, Tex., to Denver, and there is a possibility that the pipe will be placed shortly. The gas line recently reported as having been placed with the A. O. Smith Corporation, Milwaukee, is for a line to run from northern Louisiana to a Gulf port, but production against the order awaits completion of the financing of the line.

Sheets.—Prices continue to withstand the test of fairly active demand, and if the regular market quotations are being shaded, the occasions are too infre-

THE IRON AGE Composite Prices

Finished Steel June 28, 1927, 2.367c. a Lb.

One week ago.....	2.367c.
One month ago.....	2.374c.
One year ago.....	2.431c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4:	2.339c.,	April 26
1926	2.453c.,	Jan. 5:	2.403c.,	May 18
1925	2.560c.,	Jan. 6:	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15:	2.460c.,	Oct. 14
1923	2.824c.,	April 24:	2.446c.,	Jan. 2

Pig Iron June 28, 1927, \$18.71 a Gross Ton

One week ago.....	\$18.96
One month ago.....	18.96
One year ago.....	19.59
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	\$19.71,	Jan. 4:	\$18.71,	June 28
1926	21.54,	Jan. 5:	19.46,	July 13
1925	22.50,	Jan. 13:	18.96,	July 7
1924	22.88,	Feb. 26:	19.21,	Nov. 3
1923	30.86,	March 20:	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.80c. to 1.85c.
F.o.b. Chicago.....	2.00c.
Del'd Philadelphia.....	2.12c. to 2.17c.
Del'd New York.....	2.14c. to 2.19c.
Del'd Cleveland.....	1.99c. to 2.04c.
F.o.b. Cleveland.....	1.80c. to 1.85c.
F.o.b. Birmingham.....	2.00c. to 2.10c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.80c. to 1.90c.
F.o.b. Birmingham.....	2.00c. to 2.00c.

Rail Steel

F.o.b. mill.....	1.65c. to 1.80c.
F.o.b. Chicago.....	1.90c.

Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.75c. to 1.85c.
F.o.b. Chicago.....	2.00c.
F.o.b. Birmingham.....	1.90c. to 2.00c.
Del'd Cleveland.....	1.99c. to 2.04c.
Del'd Philadelphia.....	2.07c. to 2.17c.
Del'd New York.....	2.09c. to 2.19c.
C.i.f. Pacific ports.....	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.75c. to 1.85c.
F.o.b. Chicago.....	2.00c.
F.o.b. Birmingham.....	1.90c. to 2.00c.
Del'd Cleveland.....	1.99c. to 2.04c.
Del'd Philadelphia.....	1.92c. to 2.12c.
Del'd New York.....	1.99c. to 2.14c.
C.i.f. Pacific ports.....	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.30c.
All gages, 6 in. to 12 in., P'gh.....	2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net.....	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net.....	2.40c.
All gages, narrower than 6 in., Chicago, net.....	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago, net.....	2.20c. to 2.50c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.30c.
Bars, f.o.b. Chicago.....	2.30c.
Bars, Cleveland.....	2.35c.
Shafting, ground, f.o.b. mill.....	2.45c. to 2.90c.
Strips, under 12 in., f.o.b. P'gh mill.....	3.25c.
Strips, under 12 in., f.o.b. Cleveland mills.....	3.25c.
Strips, under 12 in., delivered Chicago.....	3.55c.
Strips, under 12 in., f.o.b. Worcester mill.....	3.40c.
Strip sheets, 12 in. and wider, Pittsburgh mill.....	3.00c.
Strip sheets, 12 in. and wider, Cleveland mill.....	3.00c.
Strip sheets, 12 in. and wider, Chicago mill.....	3.30c.

*According to size.

†Base price is for 1 to less than 3 tons.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.50 to \$2.55
Galv'd nails.....	4.50 to 4.55
Galvanized staples.....	3.20 to 3.25
Polished staples.....	2.95 to 3.00
Cement coated nails.....	2.50 to 2.55
	Base Per 100 Lb.
Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	2.55
Spring wire.....	3.40
Galv'd wire, No. 9.....	3.00
Barbed wire, galv'd.....	\$3.20 to 3.25
Barbed wire, painted.....	2.95 to 3.00

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill.....	2.35c.
Nos. 9 and 10, del'd Philadelphia.....	2.57c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.35c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	3.00c.
No. 24, f.o.b. Ch'go dist. mill.....	3.10c.
No. 24, del'd Philadelphia.....	3.32c.
No. 24, f.o.b. Birmingham.....	3.10c. to 3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	4.10c.
No. 24, f.o.b. Pittsburgh, B grade.....	4.00c.

Galvanized

No. 24, f.o.b. Pittsburgh.....	3.85c.
No. 24, f.o.b. Chicago dist. mill.....	3.95c.
No. 24, del'd Philadelphia.....	4.17c.
No. 24, f.o.b. Birmingham.....	3.95c. to 4.05c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.10c.
No. 28, f.o.b. Chicago dist. mill.....	3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.25c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.20c. to 4.30c.
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Tin Plate

Per Base Box

Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100.....	20-lb. coating I.C. \$16.20
lb. base.....	\$11.40
8-lb. coating I.C. 11.70.....	30-lb. coating I.C. 19.45
15-lb. coating I.C. 14.85.....	40-lb. coating I.C. 21.65

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series	Numbers	Base Per 100 Lb.
2100* (1/2% Nickel, 0.10% to 0.20% Carbon)		\$3.00
2300 (3 1/4% Nickel)		\$4.20 to 4.30
2500 (5% Nickel)		5.25 to 5.50
3100 (Nickel Chromium)		3.20 to 3.30
3200 (Nickel Chromium)		4.75 to 5.00
3300 (Nickel Chromium)		7.00 to 7.25
3400 (Nickel Chromium)		6.25 to 6.50
5100 (Chromium Steel)		3.20 to 3.30
5200* (Chromium Steel)		7.00 to 7.50
6100 (Chrom. Vanadium bars)		4.10 to 4.30
6100 (Chrom. Vanad. spring steel)		3.80
9250 (Silicon Manganese spring steel)		3.20 to 3.25
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)		4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)		4.10 to 4.30
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)		4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)		3.30 to 3.40
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)		4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2 in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

Per Gross Ton

Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	\$36.00 to 38.00

Track Equipment

(F.o.b. Mill)

Base Per 100 Lb.

Spikes, 1/2 in. and larger.....	\$2.80 to \$3.00
Spikes, 1/2 in. and smaller.....	2.80 to 3.15
Spikes, boat and barge.....	3.25
Tie plates, steel.....	2.35
Angle bars.....	2.75
Track bolts, 1 1/2 in. and 1 3/4 in.....	3.90 to 4.00
Track bolts, 3/4 in. and smaller, per 100 count.....	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Inches	Steel	Galv.	Inches	Iron	Galv.
1/2.....	45	19 1/2	1 1/2 to 2.....	22	2
3/4.....	51	25 1/2	2 1/2 to 3.....	28	11
1.....	56	42 1/2	3 to 4.....	30	13
1 1/4.....	60	48 1/2			
1 1/2 to 3.....	62	50 1/2			

Lap Weld

2.....	55	43 1/2	2.....	23	7
2 1/2 to 6.....	59	47 1/2	2 1/2.....	26	11
7 and 8.....	56	43 1/2	3 to 6.....	28	13
9 and 10.....	54	41 1/2	7 to 12.....	26	11
11 and 12.....	53	40 1/2			

Butt Weld, extra strong, plain ends

1/2.....	41	24 1/2	1 1/2 to 2.....	19	14
3/4 to 1.....	47	30 1/2	1 1/2.....	21	17
1.....	53	42 1/2	3.....	28	12
1 1/4.....	58	47 1/2	1 to 1 1/2.....	30	14
1 to 1 1/2.....	60	49 1/2			
2 to 3.....	61	50 1/2			

Lap Weld, extra strong, plain ends

2.....	53	42 1/2	2.....	23	9
2 1/2 to 4.....	57	46 1/2	2 1/2 to 4.....	29	16
4 1/2 to 6.....	56	45 1/2	4 1/2 to 6.....	28	14
7 to 8.....	52	39 1/2	7 to 8.....	21	15
9 and 10.....	45	32 1/2	9 to 12.....	16	2
11 and 12.....	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in.....	27
2 1/2 to 2 3/4 in.....	37
3 in.....	40
3 1/2 to 3 3/4 in.....	42 1/2
4 to 13 in.....	46
	1 1/2 in.....+18
	1 3/4 to 1 1/2 in.....+3
	2 to 2 1/4 in.....+2
	2 1/2 to 3 in.....+7
	3 1/4 to 4 1/2 in.....+9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.....	60	3 in.....	45
1 1/4 to 1 1/2 in.....	52	3 1/4 to 3 1/2 in.....	47
1 3/4 in.....	36	4 in.....	50
2 to 2 1/4 in.....	31	4 1/2, 5 and 6 in.....	45
2 1/2 to 2 3/4 in.....	39		

Hot Rolled

2 and 2 1/4 in.....	37	3 1/4 and 3 1/2 in.....	53
2 1/2 and 2 3/4 in.....	45	4 in.....	56
3 in.....	51	4 1/2, 5 and 6 in.....	51

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

quent to be recognized. The market may well be described as firm. The first half of this year, measured by shipments, which tell a more reliable story of the sheet market than sales and production, has made a reasonably good showing compared with the same period last year. They have been between 3½ and 4 per cent smaller this year than last year.

Tin Plate.—The backward weather this year, with the incident doubt as to the yields of fruits and vegetables, has not affected tin plate shipments to any great extent, but it is commonly expected that the curtailment of the pack will be greater than was expected and the last half requirements of tin plate will be materially smaller than they were last year. Shipments of tin plate over the first half of the year have been practically the same as for the same period in 1926, but reliable estimates suggest a slight loss. Mill operations are holding at about 75 per cent of capacity, but demand is light and with backlogs small, it is probable that a good many mills will be shut down next week. Prices are firm.

Cold-Finished Steel Bars and Shafting.—Makers now recognize the recently prevailing price of 2.30c., base Pittsburgh, as the regular market quotation, and higher quotations have disappeared. Ground shafting also has gone down \$2 a ton and is now quoted f.o.b. mill at 2.90c. per lb., base, for 1 3/16-in. to and including 1½-in., 2.75c. for 1 9/16-in. to and including 1¾-in., 2.60c. for 1 15/16-in. to 2¾-in. inclusive, and 2.45c. for 2 15/16-in. to 7-in. inclusive, in carload lots, with 25c. per 100 lb. additional for less-than-carload lots and the standard extras of Nov. 12, 1925, applying. Business is fairly active so far as the number of sales is concerned, but volume is lacking.

Hot-Rolled Flats.—Makers of hot-rolled strips have fairly large order books as a result of good-sized specifications on second quarter contracts, but lately there has been a decline in shipping instructions on contracts and new business is light. No important deviations from ruling quotations are reported.

Cold-Rolled Strips.—Makers have sufficient business to maintain fairly high mill schedules during the early part of July, but cannot see sustained operations much beyond the middle of the month, as specifications are largely in against second quarter contracts and new business is light. Buyers are not apprehensive of advances in prices and feel safe in buying in accordance with actual needs, which, so far as the automobile builders are concerned, are moderate. Prices are holding well.

Bars, Plates and Shapes.—A slight gain in orders and specifications is noted in these products as compared with last week. There is a measure of steadiness in bars and plates at 1.85c. for small lots for local consumption, but the shape market remains weak and 1.80c. is fairly common even on small lots. Mills are going to 1.80c. on bars and plates only for what they regard as preferential customers.

Bolts, Nuts and Rivets.—Makers here report that third quarter contracting is of satisfactory proportions

in these products and that it has not been necessary to revise the April 1 price schedule. Large rivets are quoted at \$2.75, base, less 2 per cent for cash, on contracts, while to non-contracting buyers \$3, base, is asked and is said to have been obtained.

Coke and Coal.—Failure of the central Pennsylvania coal operators, who have been operating their mines on the Jacksonville wage scale, to reach an agreement with the miners' union for a reduction in the scale means that mines in that region will shut down July 1. The consequent loss of production is calculated to bring demands upon the mines that are in operation, and already there has been a curtailment of coke production in the Connellsville district in the expectation of a better and more profitable market in coal. All of the blast furnaces that will be operated during the third quarter are covered on their coke requirements, and there is little demand for furnace coke beyond those requirements. There is better balance between supplies and demand, and lately \$3 per net ton at ovens is as low as spot furnace coke has been sold, while about 7500 tons for delivery over the next 30 days to the Dover, Ohio, furnace, which will go out of blast Aug. 1, was made at \$3.25. Spot foundry coke remains generally at \$4 to \$4.50, but a few premium brands command more. The coal market does not show much strength, despite low production and the fact that consumers generally are cutting into their reserves built up in preparation for the miners' strike.

Old Material.—There is little strength to the market, as the example of one or two mills in buying scrap because it was cheap has not been generally followed and while offerings are comparatively light, dealers do not have to compete with consumers to secure them. Heavy melting steel now is quotable at \$14.50 to \$15, a slight recession from the prices of a week ago. While \$14.75 is as low as any has been sold into consumption, and recently an Ohio River steel company paid 15.25, there is now no consumer interest in the market and dealers will not pay more than \$15 and have succeeded in getting some at \$14.50 for delivery at one point in the district. The prospect of a lower dip in steel production this summer than last discourages purchases by consumers and any tendency by dealers to hold scrap for an advance. Cast iron carwheels, heavy breakable cast and No. 1 cast in cupola sizes are all lower than they were a week ago, and machine shop turnings and blast furnace grades reflect the fact that short orders are fairly well covered.

The June scrap list of the Baltimore & Ohio Railroad contains 22,320 gross tons, including 7000 tons of No. 1 steel rails and 5000 tons No. 1 heavy melting steel. Bids close July 5.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:

Heavy melting steel.....	\$14.50 to \$15.00
Scrap rails	14.00 to 14.25
Compressed sheet steel.....	13.50 to 14.00
Bundled sheets, sides and ends...	12.50 to 13.00
Cast iron carwheels.....	15.00 to 15.50
Sheet bar crops, ordinary.....	14.50 to 15.00
Heavy breakable cast.....	14.00 to 14.25
No. 2 railroad wrought.....	14.50 to 15.00
Heavy steel axle turnings.....	13.50 to 14.00
Machine shop turnings.....	10.50 to 11.00

Acid Open-Hearth Furnace Grades:

Railroad knuckles and couplers..	16.75 to 17.00
Railroad coil and leaf springs...	16.75 to 17.00
Rolled steel wheels	16.75 to 17.00
Low phosphorus billet and bloom ends	19.00 to 19.50
Low phosphorus, mill plate.....	18.50 to 19.00
Low phosphorus, light grade.....	16.75 to 17.00
Low phosphorus sheet bar crops...	18.50 to 19.00
Heavy steel axle turnings.....	13.50 to 14.00

Electric Furnace Grades:

Low phosphorus punchings.....	17.00 to 17.50
Heavy steel axle turnings.....	13.50 to 14.00

Blast Furnace Grades:

Short shoveling steel turnings...	10.50 to 11.00
Short mixed borings and turnings	10.50 to 11.00
Cast iron borings.....	10.50 to 11.00
No. 2 busheling.....	10.50 to 11.00

Rolling Mill Grades:

Steel car axles.....	19.00 to 19.50
No. 1 railroad wrought.....	11.00 to 11.50

Cupola Grades:

No. 1 cast.....	15.00 to 15.50
Rails 3 ft. and under.....	17.00 to 17.50

Malleable Grades:

Railroad	14.50
Industrial	14.00
Agricultural	13.50

Warehouse Prices, f.o.b. Pittsburgh

Base per Lb.

Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets.....	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count, 62½ per cent off list	
Machine bolts, per 100 count, 62½ per cent off list	
Carriage bolts, per 100 count, 62½ per cent off list	
Nuts, all styles, per 100 count, 62½ per cent off list	
Large rivets, base per 100 lb.....	\$3.50
Wire, black soft annealed, base per 100 lb.	2.90
Wire, galvanized soft, base per 100 lb.	2.90
Common wire nails, per keg.....	\$2.80 to 2.90
Cement coated nails, per keg.....	2.85 to 2.95

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms	
	Per Gross Ton
Rerolling, 4-in. and over.....	\$33.00
Rerolling, under 4-in. to and including 1½-in.	\$33.50 to 34.00
Forging, ordinary	39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars	
	Per Gross Ton
Open-hearth or Bessemer.....	\$33.50

Slabs	
	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in.....	\$33.50 to 34.00

Skelp	
	Per Lb.
Grooved	1.80c. to 1.85c.
Sheared	1.80c. to 1.85c.
Universal	1.80c. to 1.85c.

Wire Rods	
	Per Gross Ton
*Common soft, base.....	\$42.00 to \$43.00
Screw stock	\$5.00 per ton over base
Carbon 0.20% to 0.40% ..	3.00 per ton over base
Carbon 0.41% to 0.55% ..	5.00 per ton over base
Carbon 0.56% to 0.75% ..	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is \$42.50 to \$44. Cleveland mill base, \$42 to \$43.

Prices of Raw Materials

Ores	
Lake Superior Ores, Delivered Lower Lake Ports	
	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	
	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria.....	10.50c.
Iron ore, Swedish, average 66% iron, 9.75c. to 10.00c.	
Manganese ore, washed, 52% manganese, from the Caucasus.....	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$11.00 to \$11.50
Per Gross Ton	
Chrome ore, Indian basic, 48% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard.....	\$22.50
Per Lb.	
Molybdenum ore, 85% concentrates of MoS ₂ , delivered	50c. to 55c.

Coke	
	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$3.00 to \$3.25
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.59 to 10.77
Foundry, Birmingham.....	5.50
Foundry, by-product, St. Louis.....	9.75

Coal	
	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.30 to \$1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.70 to 1.90
Mine run gas coal, f.o.b. Pa. mines	2.00
Steam slack, f.o.b. W. Pa. mines.....	1.25
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

Ferromanganese	
	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen	
	Per Gross Ton Furnace
Domestic, 19 to 21%	\$34.00
Domestic, 16 to 19%	33.00

Electric Ferrosilicon	
	Per Gross Ton Delivered
50%	\$85.00 to \$87.50
75%	145.00

Per Gross Ton Furnace	
10%	\$35.00
11%	37.00
Per Gross Ton Furnace	
12%	\$39.00
14 to 16%	\$45 to 46.00

Bessemer Ferrosilicon	
F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
10%	\$34.00
11%	36.00
	Per Gross Ton
12%	\$38.00

Silvery Iron	
F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
6%	\$26.50
7%	27.50
8%	28.50
9%	30.00
	Per Gross Ton
10%	\$32.00
11%	34.00
12%	36.00

Other Ferroalloys	
Ferrotungsten, per lb. contained metal, del'd	\$1.00 to \$1.05
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads.....	11.50c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

Fluxes and Refractories

Fluorspar	
	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.00 to \$18.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	\$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2¼% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

Fire Clay	
	Per 1000 f.o.b. Works
	First Quality Second Quality
Pennsylvania	\$43.00 to \$46.00 \$35.00 to \$38.00
Maryland	43.00 to 46.00 35.00 to 38.00
New Jersey	50.00 to 65.00
Ohio	43.00 to 46.00 35.00 to 38.00
Kentucky	43.00 to 46.00 35.00 to 38.00
Missouri	43.00 to 46.00 35.00 to 38.00
Ground fire clay, per ton	7.00

Silica Brick	
	Per 1000 f.o.b. Works
Pennsylvania	\$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton.....	\$8.50 to 10.00

Magnesite Brick	
	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick	
	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts	
Per 100 Pieces	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
	Per Cent Off List
†Machine bolts .....	.70
†Carriage bolts .....	.70
Lag bolts .....	.70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	.70
Hot-pressed nuts, blank or tapped, square.....	.70
Hot-pressed nuts, blank or tapped, hexagon.....	.70
C.p.c. and t. square or hex. nuts, blank or tapped .....	.70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ½ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts	
	Per Cent Off List
Semi-finished hexagon nuts.....	.70
Semi-finished hexagon castellated nuts, S.A.E.....	.70
Stove bolts in packages.....	.80, 10 and 5
Stove bolts in bulk.....	.80, 10, 5 and 2½
Tire bolts .....	.60 and 5

Large Rivets	
(½-In. and Larger)	
	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland.....	\$2.75
F.o.b. Chicago	2.85

Small Rivets	
(½-In. and Smaller)	
	Per Cent Off List
F.o.b. Pittsburgh .....	.70, 10 and 5
F.o.b. Cleveland .....	.70, 10 and 5 to 70 and 10
F.o.b. Chicago .....	.70, 10 and 5 to 70 and 10

Cap and Set Screws	
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	
	Per Cent Off List
Milled cap screws.....	.80, 10 and 10
Milled standard set screws, case hardened.....	.80 and 10
Milled headless set screws, cut thread.....	.80
Upset hex. head cap screws, U.S.S. thread.....	.85 and 5
Upset hex. cap screws, S.A.E. thread.....	.85 and 5
Upset set screws.....	.80, 10 and 10
Milled studs .....	.70 and 5

Chicago

Prospective Rail Orders Total 200,000 Tons—Another Steel Works Stack Out

CHICAGO, June 28.—Steel works blast furnace operations have been further curtailed by the blowing out this week of the No. 1 furnace at Gary, making the fifth stack taken out of service in four consecutive weeks by the Steel Corporation. In the meantime the Inland Steel Co. has completed repairs on and is warming up its No. 3 furnace, but as soon as it is producing satisfactory iron the No. 2 stack will be blown out for extensive repairs. There are now in blast 25 out of 36 stacks at Chicago district steel plants.

The Zenith furnace at Duluth was lighted June 25, increasing the number of active merchant stacks in Chicago territory to six out of 10.

Estimates of ingot production for the first six months of this year as compared to the corresponding period in 1926 vary from 2 per cent under to 7 per cent over, indicating an average not far from the figure of a year ago. At that time, however, production entered the summer months at a fairly steady rate, whereas today it is pointing downward, already having fallen to close to 75 per cent of ingot capacity.

Lack of interest on the part of buyers is shown more in actual specifications than in sales and inquiries. Orders taken this week have not been exceeded in any seven-day period since the week ended April 30, and it is necessary to go back to April 9 to find a week of markedly heavier purchases. Several large producers find that inquiry is more widespread and bulks larger in the aggregate than at any time this year. It now develops that rail buying may reach 200,000 tons, the necessary accessories for which would call for 55,000 tons. Two inquiries for 500 freight cars each are being quietly figured on in the Chicago market.

Pig Iron.—The Allis-Chalmers Mfg. Co., Milwaukee, has placed 3500 tons of Northern Iron at \$20, Chicago. In southern Michigan a 250-ton purchase figures back to \$19.50, Chicago, and at Muskegon, Mich., Chicago iron has been sold at \$19, base furnace, in competition with Eastern iron. The freight rates to Muskegon from Chicago and Detroit are \$3 and from Cleveland, \$4. On the whole, the melt in this district is holding steady, June shipments being on a par with those in May. Third quarter contracting is dragging because of carry-over iron from second quarter contracts and a hesitancy by many users to commit themselves for the future. The silvery market is active, probably over 3000 tons having been placed at the full schedule.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	24.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	\$31.50 to 32.00
Silvery, sil. 8 per cent.	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered at consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—The ferromanganese market is quiet, with carlot orders bringing \$90, seaboard. Among buyers there is the belief that a large tonnage would bring out lower prices. It is reported that English sellers are asking that contracts be written at \$90 with protective clauses to strengthen their position in the event of an advance above that figure before the expiration of commitments made at this time. Carloads of spiegeleisen bring \$34, Hazard, Pa., for the 16 to 19 per cent grade and \$35 for the higher grade. It is admitted that round tonnages have been taken below these figures.

Prices delivered Chicago: 80 per cent ferromanganese, \$97.56; 50 per cent ferrosilicon, \$85 to \$87.50; spiegeleisen, 18 to 22 per cent, \$41.76 to \$42.76.

Plates.—An oil producer in Oklahoma has placed 1500 tons of tankage, and fresh inquiry for oil storage

steel totals 4500 tons, bringing the total business in prospect to over 8000 tons. Efforts to control output of crude oil have not been successful and tank programs are being revived, although not in as heavy tonnage as had been expected for the reason that consumption of petroleum products is increasing as the summer months advance. Plate mills in this district are badly in need of orders, particularly in the heavy and wide sizes. In narrow widths incoming specifications from car builders and fabricators are affording fairly economical rolling schedules. The price situation has changed little. Within a 100-mile radius of Chicago the bulk of the output from local mills is being sold at 2c. At points just this side of freight equalization territory Chicago producers are naming 1.90c. in competition with Eastern mills. The same condition exists in the Southwest, particularly in Oklahoma, where Chicago mills encounter competition with both Pittsburgh and Birmingham.

Mill prices on plates per lb.: 2c., Chicago.

Rails and Track Supplies.—Orders for standard-section rails are small, and outstanding inquiry still totals close to 100,000 tons. Inquiry that is in the making and which is expected to come out within the next two weeks will call for not less than 75,000 tons. All told, the secondary, or early summer, buying of rails will probably approximate 200,000 tons, which is from three to four times the tonnage brought into the market a year ago. Western mills expect to book about 60,000 tons. Rail mill operations continue to point downward, now averaging about 65 per cent of capacity. The summer rail buying movement is expected to bring into the market about 25,000 tons of track accessories. Miscellaneous orders for track supplies placed during the week total 2000 tons of tie plates, 10,000 kegs of bolts and 8500 kegs of spikes, while fresh inquiry in odd lots is for 3500 tons of tie plates, 8000 kegs of spikes and 5000 kegs of bolts. Tie plate orders continue to sustain capacity production, and specifications for spikes and bolts have made necessary a slight advance in output. The light rail market is dull.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36 to \$38. Per lb.: Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Structural Material.—In the fabricating market, both fresh inquiries and awards are small. Local projects requiring large tonnages, such as the Medinah Athletic Club, the Daily News building and the warehouse for Marshall Field & Co., are being actively worked on by engineers and architects, but there seems to be little probability that much of this business will actually come up for bids before mid-summer. Small fabricators are barely able to hold operations at 40 to 50 per cent of capacity, and output in the larger shops has tapered to about 80 per cent. It is believed in some quarters that shop capacity in this district has been expanded too rapidly. Others point to the more common use of special shapes as having the effect of increasing shop capacity, because of the fewer number of machine and man hours necessary to fabricate a special beam or column section as compared with built-up sections. In any event there is little complaint from the mills, which find that orders for structural material are in fair volume for this time of the year.

Mill prices on plain material per lb.: 2c., Chicago.

Cast Iron Pipe.—St. Clair Shores, Mich., has divided 4525 tons of 12-in. and 1150 tons of 8-in. centrifugal pipe between the United States Cast Iron Pipe & Foundry Co. and the National Cast Iron Pipe Co. Manington, W. Va., will open bids July 6 on 246 tons of 8-in. and 110 tons of 6-in. Class C pipe. Public lettings in the West are almost wholly lacking. Dealers who had expected summer delivery inquiries to develop by the middle of June are still hopeful that a buying movement will soon get under way, but reports from outlying districts indicate that many country municipalities are holding back improvements wherever possible. Sellers, however, point to the fact that May is usually election month and that the new officers have not yet been able to get improvement programs launched. Weather conditions have interfered with pipe laying, as is shown by the fact that contractors have increased their orders materially in the last week or two. Prices are nominal at \$34 to \$35, base Birmingham, or \$42.20

to \$43.20, delivered Chicago, for 6-in. and larger diameters. Makers' backlogs are gradually being reduced, and deliveries now average 25 days.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, \$42.20 to \$43.20; 4-in., \$46.20 to \$47.20; Class A and gas pipe, \$4 extra.

Sheets.—Miscellaneous orders for sheets are holding up well, and mills, operating at close to 85 per cent of capacity, are scheduled for 12 to 18 days. Deliveries are being promised in 10 days to two weeks on galvanized and black sheets and in two to three weeks on the blue annealed product. Demand for sheets from the South is fair, but in smaller volume than had been expected by the trade. On the whole, orders are of carlot proportion from widely diversified sources.

Prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Reinforcing Bars.—The over-anxiety of dealers to obtain a share of going business in the last few weeks has demoralized prices in this market. At 2.15c., Chicago warehouse, billet steel reinforcing bars are still showing weakness, but probably not as much as a week ago. The higher prices that have been the rule on very small tonnages have practically disappeared, with no current quotations above 2.25c. Hard steel reinforcing bars are correspondingly weak, 2c., Chicago, representing the average asking price. Fresh inquiry except in small lots is light, and sellers are largely interested in following the more active of those projects that have been before the trade for some time. Recent awards and new inquiries are shown on page 1925.

Bolts, Nuts, and Rivets.—Third quarter contracts have been practically all signed at the full schedule. Specifications, on the whole, are in smaller volume except from manufacturers of farm implements.

Wire Products.—Specifications from the manufacturing trade are in smaller volume, and third quarter contracting is making very slow progress. The demand for nails in and near Chicago shows no improvement, but from the country as a whole orders are heavier than last week. Sellers in this territory are making an effort to advance wire nails to \$2.60, base, per 100-lb. keg, delivered in Chicago. This price, however, has not yet undergone a thorough test. Jobbers in the cities and larger towns are ordering less from mills, but in most of the country sections the demand is well up to the average for May. Generally, business in June, while not equal to that of May, is better than at this time a year ago.

Bars.—Shipments of soft steel bars are at the rate of 75 to 80 per cent of mill capacity, and both specifications and new buying are in excess of the current rate of mill output. Backlogs have been practically wiped out, and deliveries on all sizes of bars are prompt. Lighter specifications from several manufacturers of automobiles and from makers of motor car accessories indicate a lower demand from that trade in the summer months. On the other hand, changes of models are expected to take additional tonnages and to result in holding the interest of automobile buyers. More favorable crop reports are leading some makers of agricultural machinery to anticipate early fall business,

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforcing bars, billet steel.....	2.15c.
Cold-finished steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands.....	3.65c.
Hoops.....	4.15c.
Black sheets (No. 24).....	3.95c.
Galvanized sheets (No. 24).....	4.80c.
Blue annealed sheets (No. 10).....	3.50c.
Spikes, standard railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler.....	3.60c.
	Per Cent Off List
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, squares, tapped or blank..	60
Hot-pressed nuts, hexagons, tapped or blank.	60
No. 8 black annealed wire, per 100 lb.....	\$3.20
Common wire nails, base per keg.....	\$2.85 to 2.95
Cement coated nails, base per keg.....	2.95

and they are now ordering out slightly larger tonnages. In and near this city soft steel bars are quoted at 2c., Chicago. However, in territory where freight rates equalize with those from other producing points, 1.90c., Chicago, is being named. Specifications and orders for iron bars are heavier, but deliveries are prompt and mills have not been able to build up backlogs. Prices are steady at 2c., Chicago. Demand for alloy steel bars is off a trifle, in sympathy with the slower operations of the automobile industry. Both of the rail steel bar producers at Chicago Heights continue to operate on a double-turn basis. For the third consecutive week specifications exceed shipments by a small margin. Orders from the bed trade are more numerous, and specifications from barn equipment makers and manufacturers of lockers and shelving are steady,

Mill prices per lb.: Soft steel bars, 2c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 1.90c., Chicago.

Coke.—This market is quiet, with prices steady and shipments seeking slightly lower levels. June releases for by-product foundry coke were a trifle below the total for May.

Old Material.—The scrap market in this district is listless, and prices, in the absence of round-tonnage buying, are based on sales of carlot proportions. Scrap is coming out less freely. Low prices are holding back shipments from the country, and the manufacturing trade is producing less scrap than earlier in the month. Railroad shipments are holding at a uniform rate, which appears to conform closely to current small-lot orders and the tonnage required to fill old contracts. Trading among dealers is more active, indicating a desire to fully cover past obligations at the low prices now obtainable. Opinion is divided as to what the future holds, some believing that the market will show more activity soon after the mid-year inventory period, while others point to slower mill operations as an indication that the summer months will be dull in the scrap trade. Railroad lists include the Burlington, 4000 tons; the Big Four, 4000 tons, and the Michigan Central, a blank list.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades	
Heavy melting steel.....	\$12.00 to \$12.50
Shoveling steel.....	12.00 to 12.50
Frogs, switches and guards, cut apart, and miscellaneous rails.	13.00 to 13.50
Hydraulic compressed sheets....	10.00 to 10.50
Drop forge flashings.....	9.25 to 9.75
Forged, cast and rolled steel car-wheels.....	14.25 to 14.75
Railroad tires, charging box size.	14.50 to 15.00
Railroad leaf springs, cut apart..	14.50 to 15.00
Acid Open-Hearth Grades	
Steel couplers and knuckles.....	14.25 to 14.75
Coil springs.....	14.75 to 15.25
Low phosphorus punchings.....	14.50 to 15.00
Electric Furnace Grades	
Axle turnings.....	11.75 to 12.25
Blast Furnace Grades	
Axle turnings.....	10.00 to 10.50
Cast iron borings.....	9.75 to 10.25
Short shoveling turnings.....	9.75 to 10.25
Machine shop turnings.....	7.00 to 7.50
Rolling Mill Grades	
Iron rails.....	13.50 to 14.00
Rerolling rails.....	14.75 to 15.25
Cupola Grades	
Steel rails, less than 3 ft.....	15.00 to 15.50
Angle bars, steel.....	13.00 to 13.50
Cast iron carwheels.....	13.50 to 14.00
Malleable Grades	
Railroad.....	13.50 to 14.00
Agricultural.....	13.50 to 14.00
Miscellaneous	
*Relaying rails, 56 to 60 lb.....	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades	
Iron angle and splice bars.....	13.50 to 14.00
Iron arch bars and transoms....	18.50 to 19.00
Iron car axles.....	20.00 to 20.50
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	11.00 to 11.50
No. 2 railroad wrought.....	10.50 to 11.00
No. 1 busheling.....	9.00 to 9.50
No. 2 busheling.....	5.75 to 6.25
Locomotive tires, smooth.....	13.75 to 14.25
Pipes and flues.....	7.00 to 7.50
Cupola Grades	
No. 1 machinery cast.....	14.50 to 15.00
No. 1 railroad cast.....	13.50 to 14.00
No. 1 agricultural cast.....	13.25 to 13.75
Stove plate.....	12.50 to 13.00
Grate bars.....	11.50 to 12.00
Brake shoes.....	10.00 to 10.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

New York

Pig Iron Prices Decline—Steel Bookings in Good Volume

NEW YORK, June 28.—Pig iron prices have broken in transactions closed in this district recently. Buffalo foundry iron has been sold at \$17, base furnace, a reduction of 50c. a ton, and in at least one case even that figure was shaded. Eastern Pennsylvania foundry iron is now quoted at \$20 to \$20.50, base furnace, which also represents a recession of 50c. a ton. Base prices of eastern New York State furnaces, which vary according to points of delivery, remain on a competitive basis with those on other irons. The Richardson & Boynton Co., New York, has bought 1500 tons of No. 2 plain and 1500 tons of No. 2X for July-August-September shipment to its Dover, N. J., plant at reported delivered prices of \$20.15 for the No. 2 plain and \$20.65 for the No. 2X. It is understood that the business was divided between a Buffalo steel works stack and an eastern New York State furnace. The Lidgerwood Mfg. Co., Elizabeth, N. J., has closed for 750 tons of foundry, and the Ramapo Iron Works, Hillburn, N. Y., has placed 1000 tons of malleable. The long pending inquiry of the Richmond Radiator Co. for 3000 tons of foundry iron for Uniontown, Pa., is expected to be closed late this week. Total sales in this district during the past week are estimated at 8000 tons. Much of the current business consists of carload lots for prompt delivery, reflecting the hand-to-mouth operations of many of the jobbing foundries. While foundry melt generally appears to be declining, conditions in the industry are spotty. Some castings plants, in fact, are speeding up production. The Keystone furnace of the Reading Iron Co., Reading, Pa., has been banked.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail).....	\$21.91 to \$22.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn).....	\$19.75 to 20.50
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.89 to 23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	22.39 to 23.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

Finished Steel.—Some sellers of steel in this market derive satisfaction from the fact that orders in the latter part of June were in excess of those received in the first half, and while prospects at the moment cannot be forecast very reliably because of the day-to-day character of purchasing, the outlook is not regarded as pessimistically as it was two weeks ago. Representatives of sheet mills in particular are pleased because of the solid front the sheet trade is maintaining on third quarter prices. The sheet market has received a few severe tests. A large consumer bought 1000 tons and is said to have received no concession from any source; another large buyer received 17 bids on 1500 tons of black sheets and only one small mill offered a price lower than 3c., Pittsburgh, that bid being 2.95c. In the face of a slightly lessening demand, the discount on bolts and nuts has also been maintained, which gives encouragement to steel mills that they may also be able to keep prices at the higher level, although it is almost an axiom of the steel trade that prices cannot be successfully advanced when the demand is declining. With respect to plates, shapes and bars, the situation remains somewhat the reverse. Prices are not firm, although the situation is not much different than a week ago, except that 1.80c., Pittsburgh, on bars and 1.75c., Pittsburgh, on plates and shapes are more commonly quoted. On structural shapes the local market continues highly competitive, with 1.75c. being shaded on some of the more attractive tonnages. Specifications for steel pipe have come out more freely in the past week, following the settlement of plumbers' trade difficulties in New York, and this tonnage has helped out the June totals for New York sales offices of companies making pipe. The largest structural steel con-

tract of the week is 5000 tons for a telephone building in Newark, awarded to the American Bridge Co.

Mill prices per lb. delivered New York: Soft steel bars, 2.14c. to 2.24c.; plates, 2.09c. to 2.19c.; structural shapes, 1.99 to 2.14c.; bar iron, 2.14c.

Ferroalloys.—There have been sales of two lots of 100 and of 50 tons each of British ferromanganese at \$90 for early last half delivery. Otherwise the market is exceedingly quiet with some falling off in specifications on contract. Prices for spiegeleisen have declined owing to the offerings of at least one domestic producer and the higher grade is available on the basis of \$34, Hazzard, Pa., with the lower grade at \$33. Business in carload and small lots is being done, but no large inquiries are before the market. Specifications on ferrosilicon and ferrochromium are reported as letting up slightly.

Warehouse Prices, f.o.b. New York

Base per Lb.

Plates and structural shapes.....	2.34c.
Soft steel bars and small shapes.....	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal.....	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons.....	4.00c.
Flats and squares.....	4.50c.
Cold-rolled strip, soft and quarter hard..	5.75c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage).....	3.89c.
Long terne sheets (No. 24 gage).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galvanized annealed.....	5.15c.
Tire steel, 1½ x ½ in. and larger.....	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Machine bolts, cut thread: Per Cent Off List	
¾ x 6 in. and smaller.....	50 to 50 and 10
1 x 30 in. and smaller.....	45 to 50
Carriage bolts, cut thread:	
½ x 6 in. and smaller.....	50 and 10 to 60
¾ x 20 in. and smaller.....	50 to 50 and 5
Coach screws:	
½ x 6 in. and smaller.....	50 and 10 to 60
1 x 16 in. and smaller.....	50 to 50 and 5
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.....	\$17.33
Seamless steel, 2-in.....	20.24
Charcoal iron, 2-in.....	25.00
Charcoal iron, 4-in.....	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt.....	46	29
¾-in. butt.....	51	37
1-in. butt.....	53	39
2½-6-in. lap.....	48	35
7 and 8-in. lap.....	44	17
11 and 12-in. lap.....	37	12
Wrought Iron—		
½-in. butt.....	4	+19
¾-in. butt.....	11	+ 9
1-1½-in. butt.....	14	+ 6
2-in. lap.....	5	+14
3-6-in. lap.....	11	+ 6
7-12-in. lap.....	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box.....	\$6.45	\$6.20
Charcoal, per box—	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20.....	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Cast Iron Pipe.—The J. G. White Engineering Co., New York, has placed 5500 tons of 12-in. pipe for the Rochester Water Co., Rochester, N. Y., with R. D. Wood & Co., Philadelphia, and the United States Cast Iron Pipe & Foundry Co. The Boston metropolitan district will take contractors' bids July 15 on 1500 tons of 20-in. Class B pipe. Business generally consists of small lots. Prices are unchanged.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, \$43.25 to \$45.25; 4-in. and 5-in., \$48.25 to \$50.25; 3-in., \$58.25 to \$60.60; Class A and gas pipe, \$5 extra.

Reinforcing Bars.—Business continues at a fair seasonal rate, but some distributors report fewer sizable jobs up for estimate than has been the case for several months. The prices quoted below seem to be holding on the regular run of tonnages, and no effort is being made to meet the low prices offered on foreign steel.

Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 3.15c., delivered at job. Out of Youngstown warehouse, 2.40c., Youngstown, or 2.77½c., delivered New York.

Warehouse Business.—There has been some improvement in buying during the last few days, particularly of plates and galvanized sheets. Purchases of large individual tonnages have been made, and some jobbers feel that June business will run close to that of May in point of volume. Prices are unchanged.

Coke.—Spot foundry coke is available at the prices which have been ruling in the past week or two. Wage clauses are being written into some contracts, a fact which causes the small buyer to hesitate about anticipating his requirements. Buying in the past week has been in small volume in this district. Delivered prices of Connellsville foundry coke are: To northern New Jersey, \$8.28 to \$8.78; New York or Brooklyn, \$9.04 to \$9.54; Newark or Jersey City, N. J., \$8.16 to \$8.66 per net ton. By-product foundry coke continues at \$9.59 to \$10.77 per net ton, delivered to Newark and Jersey City.

Old Material.—The tendency of practically all grades is still downward, but in some instances where prices have reached unprofitable levels brokers are encountering difficulty in securing sufficient tonnage at the present market. No. 1 heavy melting steel continues unchanged at \$13.50 to \$14 per ton, delivered eastern Pennsylvania, but yard grade ranges from \$10.50 to \$10.75 per ton, paid on deliveries to Harrisburg, Pa., to \$11 to \$11.25 per ton, delivered to a Pottsville, Pa., consumer. Steel mill stove plate is being purchased at about \$11 per ton, delivered eastern Pennsylvania, and foundry grade is quoted by brokers at \$10.50 per ton, delivered to West Mahwah, N. J., and \$11.75 per ton, delivered to a Bridgeport, Conn., user. Chemical borings are still going forward to consumers at Bound Brook and Gibbstown, N. J., and Long Island City, N. Y. Bids were opened last week by the Interborough Rapid Transit Co., New York, on 300 tons of old rails, 139 tons of carwheels and 79 tons of miscellaneous scrap, by the Delaware, Lackawanna & Western Railroad on about 500 tons, and by the Boston Elevated Railroad on about 1000 tons.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel.....	\$10.00 to \$11.35
Heavy melting steel (yard).....	6.75 to 7.00
No. 1 heavy breakable cast.....	11.00 to 12.50
Stove plate (steel works).....	7.50 to 8.50
Locomotive grate bars.....	8.00 to 8.50
Machine shop turnings.....	6.00 to 6.50
Short shoveling turnings.....	6.75 to 7.50
Cast borings (blast furnace or steel works).....	6.75 to 7.50
Mixed borings and turnings.....	6.75 to 7.50
Steel car axles.....	15.75 to 16.25
Iron car axles (nom.).....	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	8.75
Forge fire.....	7.00 to 7.50
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 yard wrought, long.....	10.50 to 11.00
Rails for rolling.....	10.50 to 11.25
Cast iron carwheels.....	10.75 to 11.25
Stove plate (foundry).....	8.50 to 9.75
Malleable cast (railroad).....	10.75 to 11.25
Cast borings (chemical).....	12.00 to 13.00

Prices per gross ton, delivered local foundries:

No. 1 machinery cast.....	\$14.00 to \$14.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50 to 13.00
No. 2 cast (radiators, cast boilers, etc.).....	11.50 to 12.00

Cleveland

Recent Rate of Steel Buying Sustained—Pig Iron Demand Recedes

CLEVELAND, June 28.—While new demand for finished steel is still rather light, business is at least as good as it was during the previous few weeks and some of the Ohio mills and Cleveland sales offices report a slight gain in tonnage this month over May. A number of consumers in this territory will shut down their plants July 1 for a two weeks' vacation and, as a consequence, are holding up steel shipments. While a fair volume of orders is coming from some of the Michigan automobile companies, several of the motor car plants will operate at greatly reduced rates at least two or three weeks in July, while they are bringing out new models, and during that time will not take much tonnage. The automotive industry, as a whole, expects to operate during midsummer at about its normal capacity for that period.

A limited number of contracts for steel bars, plates and structural material are being placed for the third quarter, but as a rule neither buyers nor sellers are showing much interest in contracts. New structural steel work is coming out in fair volume, but prices are highly competitive. Awards during the week include 7000 tons for a bank building in Detroit and 1800 tons for a high school in Toledo. An inquiry is out for the New York Central depot in Buffalo, which will require several thousand tons.

The market has become well stabilized at 1.80c., Pittsburgh, on steel bars, plates and structural material, and mills are holding firmly at that price. While 1.85c. is still being quoted, this price is usually confined to small or undesirable lots. The local mill price on steel bars ranges from 1.80c. to 1.85c., Cleveland. Wire nails, which recently declined to \$2.50, base Cleveland or Pittsburgh, have been marked up to the former price of \$2.55.

Pig Iron.—Sales have fallen off sharply with most producers. Cleveland interests booked 30,000 tons during the week, nearly two-thirds of which was taken by one interest that has several widely scattered furnaces. Inquiries have also declined. The market has a weak tone in this immediate territory, and buyers are exerting considerable pressure on sellers for lower prices. A number are postponing buying or are placing orders only for a portion of their third quarter requirements. Foundry and malleable iron, which have been more commonly quoted at \$18, Cleveland, for delivery in the northern Ohio territory, is now being offered at \$17.50 in this territory, and there are unconfirmed reports that lower quotations have been named for shipment to more distant competitive points. At present \$17.50 to \$18 is the more common range of Lake furnace prices. For Cleveland delivery the market is unchanged at \$18.50, furnace. In Michigan \$19, furnace, is the ruling price, although for shipment to some points \$18.50 is being named. The 3000 tons of basic iron inquired for by a Canton, Ohio, consumer will be supplied by a nearby furnace.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	\$19.00
Southern fdy., sil. 1.75 to 2.25.....	24.00
Malleable.....	19.00
Ohio silvery, 8 per cent.....	31.50
Basic, Valley furnace.....	18.00
Standard low phos., Valley fur.....	27.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

Semi-Finished Steel.—Current prices are being named for the third quarter by a Cleveland producer. These are \$34, Cleveland, for sheet bars and \$33 for large billets and slabs. A number of consumers have already contracted for the quarter. As specifications are now coming out for July shipment, orders show some gain.

Sheets.—Some pressure has come from buyers to have mills accept additional specifications on expiring low-priced second quarter contracts, but this has been resisted by the mills. The new prices are generally be-

ing maintained, although some irregularity is reported on galvanized sheets, which may be due to shading by jobbers who are getting shipments on low-priced contracts. Mills are getting fair-sized specifications from the automotive industry, but the demand from other sources is rather light. Most consumers are buying sparingly, not yet being convinced that present prices will hold.

Strip Steel.—While mills have enough business to maintain recent operations, not enough tonnage is coming out to provide a back-log and not much business is being placed at the advanced prices. The market is firm on both hot and cold-rolled strip steel.

Reinforcing Bars.—Two awards, aggregating 500 tons, are reported. A fair amount of work is pending, although new inquiry during the week was light. Prices are unchanged at 1.80c., Cleveland, for billet steel bars and 1.65c. to 1.70c., mill, for rail steel bars.

Warehouse Business.—Some demand is coming from consumers for lower warehouse prices on steel bars, plates and structural material, as present prices are the same as before the reduction in mill prices. So far concessions have not been made. There is some shading on sheets by jobbers who have low-priced mill contracts.

Old Material.—The firmer market tone reported last week is still in evidence, and all prices remain at recent levels. There was no buying by the mills during the week, but dealers expect some activity early in the month. Present low prices are not tempting consumers to buy more than they need for early requirements. Ruling prices are bringing out all the scrap needed, but there does not seem to be much effort to force material on the market. Dealers are buying a limited amount of scrap to fill existing contracts, paying \$11.25 for blast furnace scrap for Cleveland delivery and \$15 to \$15.25 and \$14 to \$14.25 for Nos. 1 and 2 heavy melting steel respectively for shipment to Valley district mills. July scrap lists of automobile companies include 4000 tons from Dodge Brothers, Inc., and 4000 tons from the Chevrolet Motor Car Co., on which bids were received Monday.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades		
No. 1 heavy melting steel.....	\$13.50 to	\$14.00
No. 2 heavy melting steel.....	13.00 to	13.25
Compressed sheet steel.....	13.00 to	13.25
Light bundled sheet stampings...	11.50 to	12.00
Drop forge flashings.....	12.50 to	13.00
Machine shop turnings.....	8.75 to	9.00
No. 1 railroad wrought.....	11.50 to	12.00
No. 2 railroad wrought.....	13.75 to	14.00
No. 1 busheling.....	11.50 to	11.75
Pipes and flues.....	10.00 to	10.50
Steel axle turnings.....	12.50 to	13.00
Acid Open-Hearth Grades		
Low phosphorus forging-crops...	16.50 to	17.00
Low phosphorus, billet bloom and slab crops	17.00 to	17.50
Low phosphorus sheet bar crops...	16.00 to	16.50
Low phosphorus plate scrap.....	16.00 to	16.50
Blast Furnace Grades		
Cast iron borings.....	10.25 to	10.50
Mixed borings and short turnings	10.25 to	10.50
No. 2 busheling.....	10.25 to	10.50
Cupola Grades		
No. 1 cast.....	16.50 to	17.00
Railroad grate bars.....	12.00 to	12.50
Stove plate	12.00 to	12.50
Rails under 3 ft.....	18.00 to	18.50
Miscellaneous		
Railroad malleable	15.50 to	16.00
Rails for rolling.....	16.25 to	16.50

Coke.—Connellsville foundry coke for prompt shipment is slightly firmer, evidently because of the shutting down of ovens, and \$4.25, Connellsville, is now the

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
* Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing steel bars.....	2.25c. to 3.00c.
Cold-finished rounds and hexagons.....	3.65c.
Cold-finished flats and squares.....	4.15c.
Hoops and bands.....	3.65c.
Cold-rolled strip	3.95c.
Black sheets (No. 24).....	3.75c.
Galvanized sheets (No. 24).....	4.50c.
Blue annealed sheets (No. 10).....	3.25c.
No. 9 annealed wire, per 100 lb.....	\$2.90
No. 9 galvanized wire, per 100 lb.....	3.35
Common wire nails, base, per keg.....	2.90

*Net base, including boxing and cutting to length.

more common minimum price for prompt shipment. Premium brands are quoted up to \$5.35, ovens, for contracts. Heating coke is weak, distress fuel being offered as low as \$2.40 to \$2.50, ovens.

Alloy Steels.—Prices have been reduced about \$2 a ton on most of the grades for which there is the largest call, and July releases against specifications will be billed at the lower prices. Not a great deal of new business is coming out, and shipments continue in excess of orders.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts show a little improvement, and with some makers the June volume of orders will be larger than that in May. Some buyers are closing third quarter contracts at present prices. The demand for rivets is slow, and considerable second quarter contract tonnage will not be taken out. A few consumers have placed third quarter contracts at present prices.

Philadelphia

Plates, Shapes and Bars Lack Strength—Pig Iron Declines 50c. a Ton

PHILADELPHIA, June 28.—About the only outstanding activity of the week was the opening of bids yesterday and today by the Pennsylvania Railroad on track material, including spikes, track bolts and tie plates, and on about 18,000 tons of plates, 6000 tons of bars and 1000 tons of shapes. Low bids on the track material included \$2.80 per 100 lb. on the spikes, \$47 per net ton for the No. 1 type tie plates and \$55 per net ton for the heavy duty tie plates.

Bars and plates continue fairly firm at 1.80c. to 1.85c. per lb., base Pittsburgh, with the possibility of slightly less than the 1.80c. per lb. basis where a sizable tonnage of plates is involved. Structural shapes still show considerable irregularity, with the market largely in the hands of the eastern Pennsylvania mills, which are quoting f.o.b. mill prices instead of the Pittsburgh basis.

Pig iron is quiet, and prices show a slight downward tendency, which might be more pronounced were there any tonnages sufficiently desirable to bring out lower quotations. The scrap market, which has been definitely depressed for some time, is beginning to develop some price irregularities, a few grades registering further declines while others manifest an upward tendency.

Pig Iron.—Current purchasing is almost entirely confined to small lots of a carload to 100 tons for prompt shipment. Although some eastern Pennsylvania furnaces are still adhering to \$21 per ton, base, for foundry iron, \$20.50 per ton has begun to appear whenever there is desirable business under consideration. The basic market is quiet, but some purchasing is expected to develop in a few weeks and it is apparently conceded that a buyer of a tonnage of basic should not find it necessary to pay more than \$20.75 per ton, delivered. Recent small sales of low phosphorus iron have been made at \$25 per ton, f.o.b. furnace, and in some instances this is reported to have been slightly shaded.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$21.26 to \$21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.26
East. Pa. No. 1X.....	22.26 to 23.26
Basic (delivered eastern Pa.)...	20.75
Gray forge	21.00 to 21.50
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. New York State furnace).....	25.00
Copper bearing low phos. (f.o.b. furnace)	24.50 to 25.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.67
Virginia No. 2X, 2.25 to 2.75 sil.	27.17

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$5.17 from Virginia furnaces.

Ferromanganese.—Demand is confined to small lots for prompt shipment, there being very little contracting for third quarter requirements. Both domestic and foreign sellers continue to quote \$90 per ton, seaboard basis.

Billets.—The greater part of the present purchas-

ing is in small lots for prompt shipment, consumers showing little interest in contracting for third quarter delivery. Reolling quality ranges from \$33 to \$34 per ton, Pittsburgh, and forging billets from \$39 to \$40 per ton, Pittsburgh.

Plates.—Mill operations continue at a low level, and 1.80c. per lb., Pittsburgh, is becoming more definitely the going price for small as well as the larger lots. On a sizable tonnage it is believed that this might be slightly shaded. On the opening of bids on 18,000 tons of plates by the Pennsylvania Railroad today, 1.80c. per lb., base, f.o.b. mill, was quoted by both eastern Pennsylvania and Pittsburgh mills, one mill in West Virginia submitting a price of 1.85c. per lb., f.o.b. mill.

Structural Steel.—With producers in eastern Pennsylvania, which have freight rates into Philadelphia such as 7c., 9c. or 14.50c. per 100 lb., competing for business on an f.o.b. mill basis and a Pittsburgh mill reported to have attempted to meet this competition, current prices are decidedly irregular. While the market is nominally 1.80c. per lb., Pittsburgh, quotations of 1.80c. to 1.85c. per lb., f.o.b. eastern Pennsylvania mill, are evidently just as representative of the market. On the 1000 tons for the Pennsylvania Railroad 1.80c. per lb., Pittsburgh, and 1.80c. to 1.85c. per lb., f.o.b. eastern Pennsylvania mill, appeared. A good tonnage of structural material is involved in the opening of bids July 19 for a new section of the local subway, requiring about 8000 tons.

Old Material.—Prices are beginning to show some irregularity, a few grades showing further weakness, others showing a stronger tendency. No. 1 heavy melting steel continues unchanged at \$14 to \$14.50 per ton, but machine shop turnings have been sold at \$10.50 per ton, and stove plate at \$12 per ton is decidedly strong. Cast borings are not quotable at better than \$11 to \$11.50 per ton.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel.....	\$14.00 to \$14.50
Scrap T rails.....	13.50 to 14.00
No. 2 heavy melting steel.....	11.50 to 12.00
No. 1 railroad wrought.....	16.00 to 16.50
Bundled sheets (for steel works)	10.00
Machine shop turnings (for steel works)	10.00
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	15.00 to 15.50
Railroad grate bars.....	12.00
Stove plate (for steel works)....	12.00
No. 1 low phos., heavy, 0.04 per cent and under.....	18.00 to 18.50
Couplers and knuckles.....	16.00 to 16.50
Rolled steel wheels.....	16.00 to 16.50
No. 1 blast furnace scrap.....	10.00 to 10.50
Machine shop turnings (for rolling mill)	10.50 to 11.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.50
Shafting	18.00 to 18.50
Steel axles	19.00 to 20.00
No. 1 forge fire.....	11.00 to 11.50
Steel rails for rolling.....	16.00
Cast iron carwheels.....	15.00 to 15.50
No. 1 cast.....	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 16.00

Bars.—Prices are fairly firm, although the market is quiet at about 1.85c. per lb., Pittsburgh, on current

small business, with 1.80c. per lb. possible on a desirable tonnage, such as the 6000 tons of bars on the list of the Pennsylvania Railroad. On this inquiry 1.80c. per lb., Pittsburgh, was submitted by a Pittsburgh mill, 1.85c., per lb., f.o.b. mill, by a Buffalo producer and 1.90c. per lb. by a Cleveland seller.

Wire Nails.—The market is only moderately active. Practically all makers have advanced quotations 5c. per 100-lb. keg to \$2.55 per keg, f.o.b. Pittsburgh. Jobbers are also making an effort to advance their prices to a slightly higher level.

Imports.—The tonnage of pig iron entering the port of Philadelphia increased last week to a total of 2205 tons, of which 1905 was from India and 300 tons from the Netherlands. A total of 11,654 tons of iron ore was received from Algeria, and 6700 tons of chrome ore, from Portuguese Africa. Only 38 tons of ferro-manganese was received from England. In steel, a total of 246 tons of bars came in, 102 tons from Belgium and 144 tons from Sweden; 5 tons of hoops and 230 tons of structural material came from Belgium.

Acetylene Industry Awards Medals

Awards of the Morehead medal were made to Edmund Fouché and Augustine Davis at a banquet given in their honor by the International Acetylene Association at the Union League Club, New York, June 21, attended by leaders of the American industry.

The Morehead medal is presented for outstanding achievements in the acetylene industry. It is administered by the International Acetylene Association, and was founded in memory of Major J. T. Morehead, who was responsible for the first commercial production of calcium carbide (from which acetylene is derived).

Maxime Mongendre, French Consul in New York, accepted for Edmund Fouché, leading French scientist and inventor of acetylene appliances, the Morehead medal for 1924, awarded for basic inventions and scientific achievements having to do with the acetylene industry. Fouché has been identified with scientific developments of the acetylene industry since its beginning, having developed, together with M. Picard, the present method of transporting dissolved acetylene in cylinders filled with a porous material. His principal accomplishment, in view of its commercial importance, was the invention of the oxy-acetylene blowpipe. He is responsible for both the high pressure blowpipe and the low pressure or injector type blowpipe used in the United States and abroad.

Augustine Davis, who was awarded the 1925 medal, invented and placed on the market many successful types of acetylene apparatus, especially automatic machines for cutting and welding and several styles of generators for making acetylene from calcium carbide.

Receivership Asked for Penn Seaboard Steel Corporation

An application for a receivership for the Penn Seaboard Steel Corporation, New Castle, Del., has been filed by the Atlantic Refining Co. Claims against the company are said to total about \$272,000, claimants including the Pure Oil Co., Pennsylvania Railroad, A. M. Wood & Co., Bethlehem Steel Corporation, Delaware Electric & Supply Co., Wilmington & Philadelphia Traction Co. and the Atlantic Refining Co.

The company has plants at New Castle, Del., and Tacony, Pa. Its Penn works at Chester, Pa., was sold to the Penn Steel Castings Co. in 1924 and its New Haven Works, New Haven, Conn., was sold to the American Steel & Wire Co. in 1921. The New Castle plant has two 60-ton and one 30-ton basic open-hearth furnaces and two 30-ton acid open-hearth furnaces. It is equipped with a 34-in., two-high blooming mill and has a rated ingot capacity of 160,000 tons a year.

The Tacony plant is equipped with two 40-ton acid open-hearth furnaces, 10-in., 12-in. and 13-in. 3-high bar mills and has a rated capacity of 50,000 tons of steel ingots annually.

For the three months ended March 31, 1927, net sales were reported of \$518,675 and a loss for this period, before deducting depreciation, of \$47,312.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier.....	2.80c. to 3.00c.
Plates, 3/8-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands).....	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1 1/2 x 1 1/2 in.	3.50c.
Round-edge steel, planished.....	4.30c.
Reinforcing steel bars, square, twisted and deformed.....	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to 1/8-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24).....	4.35c.
Galvanized sheets (No. 24).....	5.20c.
Blue annealed sheets (No. 10)...	3.30c.
Diamond pattern floor plates—1/4-in.	5.30c.
1/8-in.	5.50c.
Rails	3.20c.
Swedish iron bars.....	6.60c.

San Francisco

Forward Buying of Steel Light—1500 Tons of Foreign Steel Arrives

SAN FRANCISCO, June 25 (By Air Mail).—Contraction of demand continues in nearly all departments of the market. There is a marked disinclination on the part of most buyers to anticipate their forward requirements, despite the fact that several Eastern mills are urging the advisability of placing orders now as a protection against a possible advance in ocean freight rates in late July or early August. Although buying is light there has been no recession in Eastern mill quotations on any of the heavier steel products. Plates are fairly steady at 2.30c., c.i.f. Coast ports, although 2.25c. is obtainable on a desirable tonnage. In shapes, practically all of the Eastern mills quote 2.35c. Reports of orders being placed at less lack confirmation. Of interest this week has been the arrival at this port of about 1500 tons of foreign steel. Of this amount about 1100 tons was Belgian bars, shapes and rails, and about 400 tons was Swedish steel.

Pig Iron.—While no tabulated figures are available, it is generally conceded that the amount of pig iron bought by foundries in the San Francisco Bay district in the first half of this year was appreciably less than the total for the first six months of 1926. Current sales are small, and prices remain unchanged.

Prices per gross ton at San Francisco:

*Utah basic.....	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25...	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25..	25.00
**German foundry, sil. 2.75 to 3.25.	24.25

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings of fabricated structural steel during the week total 1724 tons. Fresh inquiry calls for about 300 tons. The largest individual award, 1000 tons for a bridge near Marysville, Cal., for the Western Pacific Railroad, was taken by the United States Steel Products Co., San Francisco. In San Pedro, Cal., the Union Iron Works of Los Angeles is low bidder on 625 tons for a city hall. In this department of the market the most notable feature is the absence of inquiries calling for sizable tonnages.

Plates.—The Spring Valley Water Co., San Francisco, is preparing plans for the construction of a 54-in. pipe line from San Andreas, Cal., to the Laguna Honda reservoir, which will require about 6000 tons. The city of Santa Maria, Cal., is inquiring for 210 tons for a welded steel pipe line. No lettings of importance have been reported during the past week.

Bars.—About 1300 tons of reinforcing bars were awarded during the week, but of this amount only three jobs called for lots of over 100 tons. The largest of these, 600 tons for a high school in Oakland, Cal., was taken by the Frederick Steel Co., which will furnish foreign steel. Local reinforcing bar jobbers quote as follows: 2.75c. to 2.85c., base, per lb. on lots of 200 tons, and 3c. to 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—San Diego, Cal., has awarded 641 tons of 4, 6, 8 and 16-in. Class B pipe for street improvement work to unnamed producers through local general contractors. Silverton, Ore., placed 216 tons of 12-in. Class B pipe with the Oswego Iron & Steel Co. Williams, Cal., contracted for 277 tons of 4, 6 and 8-in. Class 150 centrifugal pipe with an unnamed maker through O. F. Fisher, general contractor. Fresh inquiry includes the following:

Clackamas, Ore., 1658 tons of 4, 10 and 12-in. Class B pipe; bids to be in July 6.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes.....	3.00c.
Soft steel bars	3.00c.
Small angles, $\frac{3}{8}$ -in. and over.....	3.00c.
Small angles, under $\frac{3}{8}$ -in.....	3.40c.
Small channels and tees, $\frac{3}{4}$ -in. to 2 $\frac{1}{4}$ -in..	3.60c.
Spring steel, $\frac{1}{4}$ -in. and thicker.....	5.00c.
Black sheets (No. 24).....	4.80c.
Blue annealed sheets (No. 10).....	3.75c.
Galvanized sheets (No. 24).....	5.35c.
Common wire nails, base per keg.....	\$3.75
Cement coated nails, 100-lb. keg.....	3.75

San Diego, Cal., 506 tons of 6 and 10-in. Class B pipe for the Valencia Park Unit No. 2, on which bids have closed. Ravenswood Water District, Redwood City, Cal., 215 tons of 4 and 6-in. Class B; bids in July 11.

Steel Pipe.—In Los Angeles the Standard Pipe & Supply Co. is low bidder on 162 tons of standard pipe for the Water and Power Commission, and in San Francisco, George H. Tay Co. is low bidder on 100 tons of 4-in. black pipe for the Hetch-Hetchy project. Santa Monica, Cal., has placed 66 tons of galvanized pipe with the Whiting-Mead Co., Los Angeles. Bids will be taken July 11 by the Ravenswood Water District, Redwood City, Cal., on 109 tons of Matheson-joint pipe, or equal. On July 6, Clackamas, Ore., will take bids on 265 tons of 3-in. standard pipe. Seattle has closed bids on 60,000 ft. of galvanized pipe, the size being unstated.

Coke.—A local importer expects a shipment of foreign coke early in July. Current sales are fair. Quotations are unchanged. Both English and German by-product coke are offered at \$11.50 to \$12.50 per net ton at incoming dock. English beehive fuel is quoted at about \$17.

Birmingham

Further Reduction of Steel Output—Pig Iron Dull, Scrap Weak

BIRMINGHAM, June 28.—Orderly readjustment of production has been under way in this section in both pig iron and steel. There has also been curtailment of coal and coke output. Basic pig iron production has been reduced, but foundry iron output has not been disturbed much as yet. Little surplus foundry iron has accumulated either on the yards of producers or of consumers. Prices remain firm at \$18 per gross ton, Birmingham, for No. 2 foundry. There is no indication that there would be any greater consumption of iron with a lower price. The larger consumers justify their small-lot buying on the grounds that they are selling their own products in small quantities. There are still some industries that are operating almost at capacity. A radiator plant may be cited as an example, while some of the cast iron pressure pipe shops are running well. On the whole, however, the demand for pressure pipe is declining. The production of pig iron in Alabama for June will show a loss in comparison with the previous month. However, output for the first half of the year will show a gain over the total for the same period last year.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil...	\$18.00
No. 1 foundry, 2.25 to 2.75 sil...	18.50
Basic	18.00
Charcoal, warm blast	29.00

Rolled Steel.—There is still a fair demand for some forms of finished steel, and many mills and shops are going well. Open-hearth furnace operations, however, have declined, and indications point to further curtailment within the next 30 days. Fabricating shops report additional bookings and steady operations. Rail orders for delivery in the last half of the year are looked for shortly. Mill prices are unchanged.

Cast Iron Pipe.—Lettings of pressure pipe are not so large as was expected following the recent reduction in prices. Shops are still going well on orders received some time back, and shipments are heavy. Little pipe is stocked on yards. Thus far there has been little reduction of employment in this industry.

Coke.—Foundry coke is in fair demand, and independent producers have had little occasion to cut down their output of that grade. Business in domestic coke is erratic, and prices are weak. Foundry coke, on the other hand, is unchanged at \$5.50 per net ton, Birmingham. Less than 80 bee hive ovens are in operation and the coke they produce brings \$6 per ton. Coal production in this State is down to 325,000 tons weekly, against a normal output of around 400,000 tons.

Old Material.—The market is quiet, and prices are weak. Some consumers, in fact, contend that they can virtually name their own prices. Heavy melting steel is quoted at \$10.50 to \$11. There is no indication of

any improvement in demand in the near future. Dealers can obtain all the old material they require and are reducing their yard forces.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel.....	\$10.50 to \$11.00
Scrap steel rails	12.50 to 13.00
Short shoveling turnings.....	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought.....	11.00 to 12.00
Rails for rolling	13.00 to 14.00
No. 1 cast	14.00 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical.....	13.00 to 13.50

Toronto

Heavier Pig Iron Inquiry for Third Quarter—Foundry Iron Output Gains

TORONTO, ONT., June 28.—Some improvement in pig iron sales for third quarter is noted in the Canadian market, but melters are coming forward slowly and so far there has been no last minute rush by lagging buyers to cover. Inquiries, however, continue to make their appearance and it is now estimated that about 60 per cent of those who generally place contracts have made known their third quarter needs. On the contrary, others are biding their time in the expectation that further developments in the market may bring them more favorable buying terms. Local blast furnace representatives are satisfied that there will be no further reductions and still have hopes for advances. As a result of this feeling they are not making strong bids for long term contracts, but are accepting only such orders as come their way. The past week brought some improvement in spot sales from melters who adhere to the hand-to-mouth buying policy. Several orders ranging from 100 to 200 tons were included in the foundry iron business done, and some smaller tonnages of malleable iron were also taken. Foundry melt is still high, and continued activity in the iron and steel industry of this country is looked for. The output of pig iron in Canada for the month of May amounted to 78,987 gross tons, which is an advance of 2 per cent over the 77,240 tons reported for April, and 9 per cent greater than the total for May, last year. The gain was entirely in foundry iron, which increased from 11,250 tons in April to 14,902 tons in May.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75.....	\$24.10
No. 2 foundry, sil. 1.75 to 2.25.....	24.10
Malleable	24.10
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75.....	26.50
No. 2 foundry, sil. 1.75 to 2.25.....	26.50
Malleable	26.50
Basic	25.50
Imported Iron at Montreal Warehouse	
Summerlee	36.00
Carron	36.00

Old Material.—While there has been some activity in the market, business continues on the dull side and sizable transactions are absent. Most consumers are content to buy in small tonnages as demands dictate, and only in a few instances have melters come forward with third quarter contracts. Owing to the limited demand of the past month, dealers have curtailed their purchases, and while yards are well stocked, a fair amount of speculative buying is being done.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel.....	\$10.50	\$9.00
Rails, scrap	11.00	10.00
No. 1 wrought	11.00	14.00
Machine shop turnings.....	8.00	7.50
Boiler plate	8.00	8.00
Heavy axle turnings	8.50	8.50
Cast borings	8.50	7.50
Steel turnings	8.00	8.00
Wrought pipe	6.00	6.00
Steel axles	15.00	17.00
Axles, wrought iron.....	17.00	19.00
Per Net Ton		
No. 1 machinery cast.....	16.00	18.00
Stove plate	10.00	13.00
Standard carwheels	14.00	16.00
Malleable scrap	14.00	14.00

St. Louis

Heavier Demand for Tin Plate—Pig Iron More Active, Scrap Steadier

ST. LOUIS, June 28.—Orders for pig iron are more numerous, encouraging makers in the belief that with any pick-up of orders for finished products melters will be compelled to make additional purchases. Several large users of pig iron in the St. Louis district report more orders and increased production, notably the National Enameling & Stamping Co. and the Fulton Iron Works, manufacturer of sugar mill machinery. Of the local maker's sales of approximately 3500 tons, northern Illinois and Iowa melters took 1000 tons, St. Louis district consumers took 1500 tons in lots of from 200 to 500 tons, and a carload went to Birmingham. Prices are unchanged.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	\$20.00 to \$20.50
Northern No. 2 fdy., delivered St. Louis	22.16
Southern No. 2 fdy., delivered....	22.42
Northern malleable, delivered....	22.16
Northern basic, delivered.....	22.16

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Old Material.—While prices are unchanged, there is a stronger tone to the market for old material for the first time in weeks. Dealers, encouraged by increased production reported by some of the larger consumers and improved prospects for others, have refused to sell at present levels. The trade is also active in covering to fill outstanding contracts, whereas in the last few weeks it has been content to wait for lower prices. Railroad lists include: Big Four lines, 5800 tons; Chicago, Burlington & Quincy, 4700 tons; Union Pacific, 3000 tons; Missouri Pacific, 111 carloads; Chicago & Alton, 700 tons; Mobile & Ohio, 650 tons (relaying rails); Nickel Plate, 600 tons; Standard Oil Co. of Indiana, Wood River, Ill., 300 tons; Chicago & Western Indiana, 15 carloads; and St. Louis-San Francisco, seven carloads.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	\$10.75 to \$11.25
No. 1 locomotive tires.....	14.25 to 14.75
Heavy shoveling steel.....	10.75 to 11.25
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart.....	12.50 to 13.00
Railroad springs	13.50 to 14.00
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	10.75 to 11.25
No. 1 bushing	9.75 to 10.25
Cast iron borings	8.75 to 9.25
Iron rails	14.00 to 14.50
Rails for rolling	13.75 to 14.25
Machine shop turnings	6.75 to 7.25
Steel car axles	18.50 to 19.00
Iron car axles	23.00 to 23.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.00 to 12.50
Steel rails, less than 3 ft.....	15.50 to 16.00
Steel angle bars	11.75 to 12.25
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	11.50 to 12.00
No. 1 railroad cast	15.00 to 15.50
Agricultural malleable	11.50 to 12.00
Relaying rails, 60 lb. and under..	20.50 to 23.50
Relaying rails, 70 lb. and over...	26.50 to 29.00

Finished Iron and Steel.—The Granite City plant of the National Enameling & Stamping Co. has put into operation five additional mills to take care of the heavy demand for tin plate. This gain was unexpected, as it

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Col'd-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24).....	5.35c.
Blue annealed sheets (No. 10).....	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
Per Cent Off List	
Tank rivets, 7/8-in. and smaller.....	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped..	60
Hot-pressed nuts, hexagons, blank or tapped	60

had been generally believed that packers were well supplied with cans. The company's tin mills are now running at 78 per cent of capacity. The demand for galvanized sheets is surprisingly active, some of this material going to the flooded sections. The call for tank plates is slow. Warehouse business has been quiet for the last 60 days, but a slight improvement was noted during the week.

Coke.—The market for coke is quiet. A few dealers have begun to stock domestic grades so as to avail themselves of the price of \$9.75, ovens, now prevailing, but real activity is lacking. Industrial grades are quiet.

Cincinnati

Keen Competition in Pig Iron—Mill Orders Fall Behind Output

CINCINNATI, June 28.—The pig iron market is showing signs of greater activity, and a number of small consumers have covered their third quarter requirements in the past week. Most of the business, however, has been taken by producers at the expense of prices, which are the lowest since pre-war days. Northern Ohio furnaces have been successful bidders for a substantial portion of the total tonnage, which in the aggregate amounted to about 12,000 tons. As an inducement to buyers Lake Erie makers have dipped as low as \$17.25, base Cleveland, although some orders have been entered at \$17.50. To meet this competition a merchant furnace in central Ohio is quoting the latter price with Cleveland as the basing point, but in Cincinnati and vicinity is asking \$19, base Ironton, which is the schedule being maintained by southern Ohio companies. Ironton furnaces are selling a moderate tonnage of third quarter iron, especially to melters located along the Ohio River for delivery by barge. At least one seller is refusing to accept business under \$19 for the base grade at furnace. Southern iron is unchanged at \$18, base Birmingham. Jackson County silvery iron producers have been making good sales to the automotive trade. While stocks have been reduced in recent weeks, both furnaces are in a position to supply all grades of their products to consumers. The purchase of more than 2500 tons of 14 to 16 per cent ferrosilicon by the Buick Motor Co. was the outstanding sale of the week. Other important transactions included 1200 tons of foundry for the Anderson Stove Co., Anderson, Ind., and a like amount for a Columbus, Ohio, company; 1000 tons of foundry for the Buckeye Incubator Co., Springfield, Ohio; 700 tons of foundry and charcoal iron for the Louisville & Nashville; 1500 tons of malleable for a consumer in the Detroit district, and 500 tons of silvery for another Michigan melter. The Norfolk & Western Railway is inquiring for 550 tons of foundry iron for third quarter delivery.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25....	\$20.89
So. Ohio malleable	\$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25....	21.69
Alabama fdy., sil. 2.25 to 2.75....	22.19
Tennessee fdy., sil. 1.75 to 2.25..	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Warehouse Prices, f.o.b. Cincinnati

	Base per lb.
Plates and structural shapes....	3.40c.
Bars, soft steel or iron.....	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel.....	4.75c. to 5.00c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 24)...	3.60c.
Structural rivets	3.85c.
Small rivets.....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base per 100 lb. keg..	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

Finished Material.—Decreased sales are reported by district mills, total orders calling for only about 85 per cent of current production. Unless the next week brings larger bookings, operating schedules will have to be revised downward to conform to the reduced requirements of consumers. The uncertain price situation, which holds out the possibility of a further reduction on certain products, has deterred buyers from specifying against present contracts and closing for third quarter needs. As a consequence, many purchasers are temporarily taking just enough stock to care for current business. Structural steel probably is the most active line in this territory. A number of large projects are ready for bids, and still others are expected to appear in the coming month. Fabricators are fairly well engaged, but in most cases are in a position to take on sizable jobs. Makers of gas holders state that business has consisted principally of a substantial volume of small orders. The Stacey Mfg. Co. has recently closed four contracts for which approximately 700 tons of plates will be bought. The bar market, at 1.80c. to 1.85c., base Pittsburgh, is showing a tendency toward weakness. In both structural shapes and plates, quotations are being made at 1.80c., base Pittsburgh. A pickup in the demand for wire goods is noticeable, sales having taken an upward turn and prices having become better stabilized. Common wire nails are being sold at \$2.64 per keg, delivered in this city. Little third quarter buying has been recorded in sheets, and no price irregularities have been disclosed, although there has been little opportunity to test the new schedule. Operations of sheet mills in this district continue at about 95 per cent of capacity.

Reinforcing Bars.—An inquiry for about 1500 tons of new billet bars for the Chesapeake & Ohio bridge spanning the Ohio River at Cincinnati is the outstanding feature of the market. Awards have been limited to small lots ranging from 25 to 100 tons. New billet stock is obtainable at 1.80c. to 1.85c., base Pittsburgh, while rail steel bars are quoted at 1.75c., base mill.

Warehouse Business.—While sales declined somewhat in the past week, total bookings for June are about on a par with those for May. Demand for structural steel has fallen off considerably, but the decrease has been offset by a heavy movement of bars. Recent changes in mill prices on various commodities have not affected quotations on material from local warehouses.

Coke.—While no word has come from by-product coke companies regarding prices for July, foundry grades are likely to remain unchanged at \$7.50, ovens, or \$9.62, delivered Cincinnati. Domestic coke also is expected to stay at its present level. Specifications for by-product foundry coke by companies identified with the automobile industry have been in liberal volume. A local dealer has sold approximately 10,000 tons of Wise County foundry coke to a Wisconsin consumer for delivery during the next year. New River and Wise County prices are firm at the prevailing schedule.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, \$9.52 to \$9.64; Wise County coke, \$7.59 to \$8.09; New River coke, \$10.09 to \$10.59. Freight rates: \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

Old Material.—Reduction in steel plant operations has adversely affected the demand for scrap, and some buyers have asked for a temporary suspension of deliveries on current contracts. While prices have not changed in the past week, they are merely nominal. Dealers look for no acceleration of activities until the end of the summer.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$11.50 to \$12.00
Scrap rails for melting.....	12.50 to 13.00
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets.....	9.50 to 10.00
Cast iron borings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.00 to 7.50
Rails for rolling	14.00 to 14.50
No. 1 locomotive tires.....	14.50 to 15.00
No. 1 railroad wrought	11.50 to 12.00
Short rails	17.50 to 18.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast.....	17.50 to 18.50
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.50 to 9.00
Stove plate	10.00 to 10.50
Brake shoes	10.25 to 11.00
Railroad malleable	12.50 to 13.00
Agricultural malleable	12.00 to 12.50

Boston

Low Price Named on Shapes—Furnaces Quote on Fourth Quarter Pig Iron

BOSTON, June 28.—Pig iron buying in New England is almost at a standstill. Furnaces east of Buffalo are still quoting \$18.50 to \$20 per ton, base furnace. Little iron has been booked in June at \$20, however. One melter is in the market for several hundred tons of No. 2X and No. 1X iron for fourth quarter delivery. Three furnaces have submitted prices corresponding with those commonly quoted for third quarter. This is the first indication that more than one furnace will accept fourth quarter business, and the feeling is growing that a buying movement for the last quarter will develop earlier than was anticipated a week or two ago. Railroad officials intimate that new freight rates from Buffalo to certain New England points will be put into effect before the close of 1927, based on rates from Buffalo to Troy, N. Y., and from Troy to New England points. For instance, it is stated that the rate from Buffalo to Rutland, Vt., is to be \$3.66 a ton, contrasted with the prevailing rate of \$4.91.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25.....	\$21.91 to \$22.41
Buffalo, sil. 2.25 to 2.75.....	22.41 to 22.91
East. Penn., sil. 1.75 to 2.25.....	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75.....	24.65 to 25.15
Virginia, sil. 1.75 to 2.25.....	27.42
Virginia, sil. 2.25 to 2.75.....	27.92
Alabama, sil. 1.75 to 2.25.....	24.91 to 26.77
Alabama, sil. 2.25 to 2.75.....	25.41 to 27.27

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.92 from Virginia, \$6.91 to \$8.77 from Alabama.

Warehouse Business.—Some of the local warehouses have again put into effect quantity differentials on hot-rolled bars, bands, angles, channels and tees. On orders amounting to less than 1000 lb. the quantity differential is 50c. per 100 lb. On orders of 1000 to 2000 lb. it is 20c. The extra does not apply to each individual item on an order, but to the total weight of any one order regardless of the number of items. Warehouses have issued new prices and quantity differentials on sheets. Heretofore prices were established on the following lots; one bundle, two bundles, three to 49 bundles, 50 to 99 bundles, and 100 bundles and more. Lot differentials now are on the following basis: one bundle, two bundles, three to 24 bundles, 25 to 99 bundles, and 100 bundles and more. On one and two-bundle lots of one-pass cold-rolled sheets, prices have been raised 20c. to 5.90c. for No. 28 gage. The advance on other lots grades down to 5c. on 100-bundle and larger lots. On 100 bundles and more of galvanized sheets prices remain unchanged at 5.50c. on No. 28, but on smaller lots advances range up to 35c. Quotations on galvanized "ingot iron" and "toncan" metal sheets are unchanged.

Shapes and Plates.—One mill has offered standard shapes at 1.60c. per lb., base Pittsburgh, but the large mills are holding at 1.75c. The general asking price on plates is 1.80c., base Pittsburgh, but most bookings are at 1.75c. One mill quotes 1.70c. Marcus Loew, Inc., has plans out for a theater and stores at Providence,

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars —	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats.....	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

R. I. It is one of the largest fabricating jobs that has come up in New England for some time, but will be handled from New York.

Coke.—Deliveries of New England by-product foundry coke have been gradually receding. In former years the low point in shipments has come between the middle of June and the middle of July, and indications are that this will be the case this year. In contrast, the demand for domestic fuel is fairly active, owing largely to stocking by dealers. Domestic coke for shipment to dealers is \$9 a ton, on cars, at Everett, Mass., and to industrial plants, \$8.75. The New England Coal & Coke Co. and the Providence Gas Co. are billing out foundry coke at \$12 a ton, delivered, within a \$3.10 freight rate zone. These companies are not expected to make any change in the price July 1.

Old Material.—Because of the unsatisfactory prices offered for scrap by steel mills and others and because of rejections on more than 80 per cent of the shipments made, local dealers are standing pat and consequently the movement of scrap out of New England is down to the minimum. A consumer outside of New England is in the market for galvanized skeleton at a delivered price equivalent to \$2.80 a ton on cars here, allowing 10c. commission for the seller. Another mill wants several hundred tons of 6 x 12-in. yard steel at \$11 a ton, delivered in Pennsylvania. With buying of yard steel for export at \$8.50 a ton on dock, Boston, there is little likelihood of shipments going to Pennsylvania.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$9.00 to \$9.50
Scrap rails	8.50 to 9.00
No. 1 railroad wrought.....	11.00 to 11.50
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	4.75 to 5.25
Cast iron borings (steel works and rolling mill)	5.50 to 6.00
Bundled skeleton, long	5.00 to 5.25
Forged flashings	5.50 to 6.00
Blast furnace borings and turnings	5.50 to 6.00
Forged scrap	6.00 to 6.50
Shafting	13.50 to 14.00
Street car axles	14.50 to 15.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.00 to 8.50
Rails for rerolling	11.00 to 11.50
Cast iron borings, chemical.....	10.50 to 11.00

Prices per gross ton, delivered consumers' yards:

Textile cast	\$14.50 to \$15.50
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	12.00 to 12.50
Railroad malleable	14.50 to 15.00

Buffalo

Pig Iron Prices Down 50c. a Ton—Plates, Shapes and Bars Decline

BUFFALO, June 28.—Quotations of \$18, base Buffalo, on pig iron have virtually disappeared, and a general reduction of 50c. brings the market on miscellaneous lots to \$17.50, with \$17 possible on major tonnages. A fair volume of inquiry is out, with a 3000-ton lot for a New Jersey melter heading the list. Of this 1500 tons is No. 2 plain and 1500 tons is No. 2X foundry. Other pending business includes one lot of 1500 tons of foundry. An inquiry out earlier in the week for 1000 tons of malleable has been closed, the order having been placed with a Buffalo maker. Several 50, 100 and 200-ton lots are being figured on.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25..	\$17.00 to \$17.50
No. 2X foundry, sil. 2.25 to 2.75..	17.50 to 18.00
No. 1X foundry, sil. 2.75 to 3.25..	18.50 to 19.00
Malleable, sil. up to 2.25.....	17.00 to 17.50
Basic	17.00
Lake Superior charcoal	27.28

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes.....	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons. 4.45c.	
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg.....	\$3.65
Black wire, base per 100 lb.....	3.90

Finished Iron and Steel.—Mill prices have again sagged, and soft steel bars, as well as plates and shapes, are being quoted at lower figures. These commodities in sizable tonnages can be bought by regular customers at 2.065c., Buffalo. Others must pay 2.115c. and even 2.165c., depending on the amount of tonnage and the specifications. Business in sheets is reported good. An order for 100 tons of reinforcing bars for a Jamestown, N. Y., warehouse has been placed in Buffalo. Mill operations average 70 per cent.

Old Material.—The market is almost entirely inactive, and there has been a further softening of the prices. No new buying has been done by the mills, and trading among dealers is limited. No. 1 machinery cast and stove plate are unusually weak because of the fact that consumers appear to be adequately stocked. Production of automobile plant scrap is declining.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades		
No. 1 heavy melting steel.....	\$14.75 to	\$15.00
No. 2 heavy melting steel.....	14.00 to	14.25
Scrap rails	14.50 to	15.00
Hydraulic compressed sheets.....	12.75 to	13.25
Hand-bundled sheets	9.50 to	10.00
Drop forge flashings	12.75 to	13.25
No. 1 busheling	13.50 to	14.00
Heavy steel axle turnings.....	13.75 to	14.00
Machine shop turnings	9.00 to	9.50
Acid Open-Hearth Grades		
Railroad knuckles and couplers..	16.00 to	16.50
Railroad coil and leaf springs...	16.00 to	16.50
Rolled steel wheels.....	16.00 to	16.50
Low phosphorus billet and bloom ends	17.00 to	17.50
Electric Furnace Grades		
Heavy steel axle turnings.....	13.75 to	14.00
Short shoveling steel turnings...	10.75 to	11.00
Blast Furnace Grades		
Short shoveling steel turnings...	10.75 to	11.00
Short mixed borings and turnings	10.00 to	10.50
Cast iron borings	10.75 to	11.00
No. 2 busheling	11.00 to	11.50
Rolling Mill Grades		
Steel car axles	16.00 to	16.50
No. 1 railroad wrought	13.00 to	13.50
Cupola Grades		
No. 1 machinery cast.....	14.25 to	14.75
Stove plate	13.00 to	13.50
Locomotive grate bars.....	11.00 to	11.50
Steel rails, 3 ft. and under.....	17.00 to	17.50
Cast iron carwheels	15.00 to	15.50
Malleable Grades		
Railroad	15.50 to	16.00
Agricultural	15.50 to	16.00
Industrial	15.50 to	16.00

Detroit Scrap Prices Decline—Heavier Automobile Output Expected

DETROIT, June 28.—The old material market has recorded some further declines during the past week and the general tone is decidedly weak, owing to the fact that releases of scrap have been very heavy and there has been very little buying for future delivery. Stove and heating furnace producers are operating on a much lower basis than a year ago. Releases of automotive castings for July are expected to be on a high production basis.

Per Gross Ton	
Heavy melting and shoveling steel	\$11.75 to \$12.75
Borings and short turnings.....	8.25 to 8.75
Long turnings	7.50 to 8.00
No. 1 machinery cast.....	17.00 to 18.00
Automobile cast	18.50 to 19.50
Hydraulic compressed.....	11.00 to 11.50
Stove plate	13.50 to 14.50
No. 1 busheling	10.50 to 11.00
Sheet clippings	7.75 to 8.25
Flashings	10.50 to 11.00

The Jones & Laughlin Steel Corporation has contracted with the Central Iron & Steel Co., Harrisburg, Pa., to handle the latter's floor plate in its warehouses at Chicago, Pittsburgh, Cincinnati and Memphis, Tenn.

Hickman, Williams & Co. have obtained the exclusive agency to sell charcoal pig iron for James D. Lacey & Co., operating agents for the receivers of the Charcoal Iron Co. of America, with furnaces at Newberry and Manistique, Mich.

Puddlers to Continue Working After Contract Expires

YOUNGSTOWN, June 28.—For the first time in several years, a clause in the agreement between the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers providing for the continuance of employment for 30 days at the expiration of a contract, in the event a new agreement is not reached, will be invoked this year.

Since the disagreement at Atlantic City, N. J., of conferees called to renew the contract governing wages and working conditions of puddlers and mill hands of muck, bar and guide mills, no additional conferences have been held. The present contract expires June 30, and the conferees will not meet until after July 4. In the meantime, however, the affected workmen will continue until July 31, at least. Terms of a new agreement negotiated in the interim will be retroactive to July 1.

In spite of the failure to renew the contract, the bi-monthly examination of sales sheets to determine tonnage rates is scheduled as usual for this month. The chief demands of the men include a different scaling of wages according to base prices now fixed. This arrangement would involve a wage increase of about 15 per cent on the present average sales price.

The principal plant affected by the agreement is the works at Girard, Ohio, of the A. M. Byers Co., Pittsburgh. This property has 88 puddling furnaces and employs 600 puddlers, besides mill crews.

Subject to changes that may be made in the annual wage agreement, tonnage rates for puddlers and finishing mill hands in Mid-Western mills continue for July-August at the same rates that applied in May-June. Puddlers will receive \$11.13 per ton. At the bi-monthly examination, conducted in Pittsburgh, the average selling price of bar iron shipped by subscribing mills for the 60 days ended June 20, was 1.95c. per lb., which is unchanged from the average two months before.

Valley Mills Book Substantial Orders for Strip

YOUNGSTOWN, June 28.—Substantial orders are being received by Mahoning Valley mills for strips and stripsheets for third quarter delivery. One important producer of these products has over two months' production already booked. Aside from the buying by automobile interests, including the Packard, Dodge and Chevrolet companies, there is widespread buying for miscellaneous uses by makers of cameras, electrical supplies, hardware, automobile parts, washing machines and the like. Strip prices are holding, and bulk of current business is being placed on the basis of 2.10c., Pittsburgh, for hot-rolled wide strips; 2.30c., for hoops and bands; 3.25c., for cold-rolled strip; and 3c., for stripsheets.

New Ingot Mold Plant to Start Operations

The new plant at Hubbard, Ohio, of the Valley Mould & Iron Corporation, representing an investment of \$1,000,000, was scheduled to start June 22. It has a rated monthly capacity of 30,000 tons of ingot molds, and with plants at East Chicago, Ind., and at Sharpsville, Pa., gives the company a monthly capacity of 60,000 tons. Eventually the Sharpsville plant will be abandoned. Iron for the new Hubbard property is secured from the blast furnaces adjacent to the Youngstown Sheet & Tube Co., which have been improved and modernized.

A number of Mid-Western independent sheet rollers subscribing to the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers have not taken advantage of the 3 per cent reduction in tonnage rates allowed by the last examination, held in May. The companies preferred to absorb the difference, which, it is estimated, would have averaged 30 cents per ton in cutting costs.

NON-FERROUS METAL MARKETS

The
Week's
Prices

Cents per Pound
for
Early Delivery

	June 28	June 27	June 25	June 24	June 23	June 22
Lake copper, New York....	12.62½	12.62½	12.62½	12.62½	12.62½	12.62½
Electrolytic copper, N. Y.*	12.37½	12.37½	12.37½	12.37½	12.25	12.25
Straits tin, spot, N. Y.	66.00	66.50	...	66.87½	67.37½	67.62½
Lead, New York.....	6.40	6.40	6.40	6.40	6.40	6.40
Lead, St. Louis.....	6.15	6.15	6.15	6.15	6.15	6.15
Zinc, New York.....	6.57½	6.57½	6.55	6.55	6.55	6.52½
Zinc, St. Louis.....	6.22½	6.22½	6.20	6.20	6.20	6.17½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, June 28.—Lack of demand, accompanied by fairly firm prices, is the general characteristic of practically all markets. Copper buying is very light, but quotations are tending upward, if anything. Tin prices are a little lower accompanied by fair activity. The lead market is dull with quotations changed but little. Consumers are buying but little zinc, nevertheless prices are firmer.

Copper.—Consumers and producers are in a deadlock so far as buying is concerned. Most producers are adhering to 12.62½c., delivered in the Connecticut Valley, for electrolytic copper, and consumers are unwilling to buy at more than 12.50c. The needs of the latter are very light at present, as demand for their products is falling off. The foregoing has been the situation for a week or ten days. It is stated that practically all the metal available recently at 12.50c. from one or two producers has been cleaned out and none can be bought at less than 12.62½c., delivered. While the demand is so light that the price situation cannot be fairly tested out, the quotation appears to be fairly well agreed upon at 12.62½c., delivered. There is also very little demand from foreign consumers. The official quotation of Copper Exporters, Inc., was lowered on June 21 to 13c. c.i.f. Hamburg, where it still stands. Lake copper is quoted at 12.62½c., delivered.

Tin.—The week has been a very quiet one with about 900 tons reported sold for the six days ended with Saturday, June 25. There has been very little

demand for spot or June delivery and this has been reflected in falling prices which are now nearer to the July quotation than they were a month or so ago. On June 15 the premium for spot or June delivery over that of July was about 2c. per lb., while last Friday, June 24, it had shrunk to 1c. Demand on the part of consumers for spot and June metal is light. Some consumers are rather eager to sell June and spot delivery so as to gather in the premium before it vanishes, but there is not much to sell. Yesterday, June 27, the market was quiet with about 150 tons sold and today about 400 tons for all positions changed hands. Spot Straits tin today was quoted at 66c., New York. In London today spot standard was quoted at £296 5s., future standard at £284 15s. and spot Straits at £305 5s. The Singapore price today was £293 5s. Arrivals thus far this month have been 5580 tons, with 5775 tons reported afloat.

Lead.—The activity prevalent about ten days or two weeks ago has subsided and the market is decidedly quiet. There are no particular signs of weakness except possibly that London prices are falling. The leading interest continues to quote 6.40c., New York, as its contract price, and in the outside market quotations are a little firmer at 6.15c., St. Louis.

Zinc.—Ore prices at Joplin have advanced and are now at a range of \$40 to \$42 a ton. Last week 6000 tons was sold at \$40 and then the Steel Corporation had to pay \$41 to \$42 for over 8800 tons. This is reflected in the greater firmness of quotations for prime Western zinc which today stands at 6.22½c., St. Louis, or 6.57½c., New York. There have been a few sales of moderate tonnages, but consuming demand is generally light. Another factor in the firmness is the disinclination of producers to sell at present levels with ore prices higher.

Antimony.—Quietness pervades the entire market with Chinese metal quoted at 12.25c. per lb., New

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	69.50c. to 70.50c.
Tin, bar	71.50c. to 72.50c.
Copper, Lake	13.75c.
Copper, electrolytic	13.50c.
Copper, casting.....	13.00c.
Zinc, slab	7.25c. to 8.25c.
Lead, American pig	7.50c. to 8.50c.
Lead, bar	9.50c. to 10.50c.
Antimony, Asiatic	14.50c. to 15.00c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure).....	29.00c. to 30.00c.
Babbitt metal, commercial grade.....	30.00c. to 40.00c.
Solder, ½ and ¼	42.00c. to 43.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	72.50c.
Tin, bar	74.50c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting.....	13.25c.
Zinc, slab	8.00c.
Lead, American pig.....	7.25c.
Antimony, Asiatic	18.00c.
Lead, bar	9.00c.
Babbitt metal, medium grade.....	21.50c.
Babbitt metal, high grade.....	78.50c.
Solder, ½ and ¼	42.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	17.50c. to 18.25c.
Copper, hot rolled.....	21.25c. to 22.25c.
Copper, cold rolled, 14 oz. and heavier,	23.50c. to 24.50c.
Seamless Tubes—	
Brass	22.37½c. to 23.37½c.
Copper	23.25c. to 24.25c.
Brazed Brass Tubes.....	25.50c. to 26.50c.
Brass Rods	15.25c. to 16.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks.....	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products were reduced ¼c. on June 23. There has been no change in the quotations on zinc sheets and lead full sheets since May 25 and May 16 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	17.50c.
Copper, hot rolled.....	21.25c.
Zinc	9.75c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	22.37½c.
Copper	23.25c.
Rods—	
High brass	15.25c.
Naval brass	18.00c.
Wire—	
Copper	14.50c.
High brass	18.00c.
Copper in Rolls.....	20.25c.
Brazed Brass Tubing.....	25.50c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse (Prices Cover Trucking to Customers' Doors in City Limits)	
Base per Lb.	
Sheets—	
High brass	18.50c.
Copper, hot rolled.....	21.25c.
Copper, cold rolled, 14 oz. and heavier.....	23.50c.
Zinc	11.00c.
Lead, wide	10.00c.
Seamless Tubes—	
Brass	23.87½c.
Copper	24.75c.
Brazed Brass Tubes.....	27.75c.
Brass Rods	15.25c.

York, duty paid, for spot delivery, with futures at 12.50c.

Nickel.—Ingot nickel in wholesale lots is being offered at 35c. per lb., with shot nickel at 36c. and electrolytic nickel at 39c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted in wholesale lots at 25c. to 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

JUNE 28.—The demand for copper has been steady and the price is unchanged. Although the price of antimony is the same as last week, it lacks strength. The old metal market is dull and prices are nominal.

Prices, per lb., in carload lots: Lake copper, 12.75c.; tin, 68.50c.; lead, 6.25c.; zinc, 6.35c.; in less-than-carload lots, antimony, 14c. On old metals we quote copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 8.75c.; red brass, 8.75c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 14c.; all being dealers' prices for less-than-carload lots.

RAILROAD EQUIPMENT

Lehigh Valley Is Inquiring for 1000 Cars— Lehigh & New England Buys 200

The principal business pending in the railroad equipment market is 1000 freight cars for the Lehigh Valley and 500 for the Chicago & North Western. The Lehigh & New England has bought 200 cars. Details follow:

The Carnegie Steel Co. has contracted with the Pressed Steel Car Co. for the repair of 150 steel hopper cars.

The Fruit Growers Express is inquiring for 300 steel underframes.

The Lehigh Valley is inquiring for 500 steel hopper cars and 500 box cars.

The Erie is inquiring for 25 baggage-express cars.

The New York, New Haven & Hartford is in the market for 15 underframes for baggage cars.

The Norfolk & Western has ordered 25 mail storage cars from the Bethlehem Steel Co.

The Chicago & North Western will buy 500 box cars.

The Norfolk & Western is in the market for 25 mail cars.

The Lehigh & New England has placed 200 freight cars with the Pressed Steel Car Co.

The Missouri Pacific is in the market for five Mikado locomotives.

New Company Formed to Operate Milwaukee Stack

The Milwaukee Blast Furnace Co., successor to the Thomas Furnace Co., Milwaukee, has been incorporated with a nominal capital stock of 500 common shares without par value. The Thomas company had capital stock totalling \$1,500,000. The new owners are considering making improvements to the furnace and resuming operation upon approval by the court of the purchase of the property.

The Ford Motor Co., Detroit, will soon put into operation two new batteries of by-product coke ovens at its River Rouge plant. One battery of 60 ovens will be lighted on July 8 and the other battery, also consisting of 60 ovens, will go into operation in the next 60 days.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible.....	11.00c.	12.25c.
Copper, heavy and wire.....	10.75c.	11.75c.
Copper, light and bottoms....	9.25c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.00c.
Heavy machine composition.	8.75c.	10.125c.
No. 1 yellow brass turnings.	7.50c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.00c.	5.625c.
Lead, tea	4.00c.	4.50c.
Zinc	4.00c.	4.25c.
Sheet aluminum.....	13.50c.	15.50c.
Cast aluminum	13.50c.	15.50c.

FABRICATED STRUCTURAL STEEL

Detroit Building Takes 7000 Tons and One in Newark, N. J., 5000 Tons

With structural steel contracts for the week totaling 35,000 tons and new projects amounting to 22,000 tons, it is apparent that building construction is not letting down to any great extent. Awards include 7000 tons for an addition to a bank and office building in Detroit and 5000 tons for a telephone building in Newark, N. J. A 54-in. water pipe line in California, now up & New England has bought 200 cars. Details follow:

NEW HAVEN, CONN., 1100 tons, medical building for Yale University, to Lehigh Structural Steel Co.

HARTFORD, CONN., 300 tons, power plant, Hartford Electric Light Co., to Fort Pitt Bridge Works.

HARTFORD, 330 tons, bridge at Poquetanock Cove, to unnamed fabricator.

BOSTON, 151 tons, store and office building, Newbury and Berkeley Streets, to New England Structural Co.

QUINCY, MASS., 100 tons, bridge, to Boston Bridge Works, Inc.

NEW YORK, 5150 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: Telephone building, Elmhurst, Queens, and children's house for Hickok Memorial Church, Scarsdale, to Elditz & Ross; 10-story office building at Cortland Avenue and East 149th Street, and 13-story apartment building at Fifth Avenue and Eighty-seventh Street, to A. E. Norton, Inc.; Sentinel Building, Hempstead, L. I., office building at Sixtieth Street and Madison Avenue, and factory building, 614 East Fourteenth Street, to Levering & Garrigues Co.; 14-story apartment building at 117 East Seventy-second Street, to Taylor-Fichter Steel Construction Co.

NEW YORK, 300 tons, building on West Fifty-second Street, to Easton Structural Steel Co.

NEW YORK, 170 tons, cab ramp, Pennsylvania station, to American Bridge Co.

JERSEY CITY, 120 tons, West Side Avenue bridge for Central Railroad of New Jersey, to Bethlehem Steel Co.

NEWARK, N. J., 5000 tons, New York Telephone Co. building on Broad Street, to American Bridge Co.

POINT PLEASANT, N. J., 150 tons, canal bridge, to American Bridge Co.

DETROIT, 7000 tons, addition to First National Bank Building, to Russell Wheel & Foundry Co.

AKRON, OHIO, 500 tons, Exchange Street bridge, to Berger Iron Works.

LUFTON, TEX., 1700 tons, six 80,000-bbl. tanks for Gulf Pipe Line Co., to a Southwestern fabricator.

ATLANTIC CITY, N. J., 145 tons, armory, to Belmont Iron Works.

LANCASTER COUNTY, PA., 100 tons, highway bridge, to Shoemaker Bridge Co.

SYRACUSE, N. Y., 400 tons, Syracuse Herald building, to R. S. McMannus Steel Construction Co.

PITTSBURGH, 250 tons, Argonaut Realty Building, to Jones & Laughlin Steel Corporation.

TOLEDO, OHIO, 1800 tons, Woodward High School, to American Bridge Co.

ROSSFORD, OHIO, 400 tons, Edward Ford Plate Glass Co., plant extension, to American Bridge Co.

CLEVELAND, 625 tons, Pennsylvania Railroad bridge, to American Bridge Co.

CHICAGO, 465 tons, Milk Dealers' Bottle Exchange, to Vierling Steel Works, local.

CHICAGO, 185 tons, outdoor structure at Crawford Avenue Station of the Commonwealth Edison Co., to Vierling Steel Works.

CHICAGO, 100 tons, signal bridge work, to Vierling Steel Works.

CHICAGO, 4000 tons, Engineers' Building, to American Bridge Co.; previously reported as having been taken by the Midland Structural Steel Co.

ILLINOIS and WISCONSIN, 100 tons, highway bridge work, to Continental Bridge Co., Chicago.

ANACONDA, MONT., 500 tons, zinc plant, Anaconda Copper Mining Co., to Kansas City Bridge & Structural Steel Co.

DENVER, COLO., 3500 tons, building for Mountain States Telephone & Telegraph Co., to American Bridge Co.

VANCOUVER, WASH., 140 tons, State School for the Blind, to an unnamed fabricator.

SAN FRANCISCO, 1000 tons, bridge near Marysville, Cal., for the Western Pacific Railroad, to United States Steel Products Co.

SAN FRANCISCO, 210 tons, apartment building, Stockton and Union Streets, to Central Iron Works, local.

SAN FRANCISCO, 320 tons, apartment building, 1940 Vallejo Street, to Central Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BUFFALO, tonnage unstated, New York Central Union Depot.

BUFFALO, 775 tons, city court buildings; new bids asked.

GALLON, OHIO, 300 tons, factory addition for Gallon Metallic Vault Co.

BOSTON, 285 tons, Jewish temple.

STAMFORD, CONN., 550 tons, office building for Stamford Gas & Electric Co.

SPARKILL, N. Y., 1400 tons, Sparkill viaduct for State Highway Department.

NEWARK, N. J., 2300 tons, viaduct, route 1, section 13, State of New Jersey.

PHILADELPHIA, 500 tons, new flooring, Girard Avenue bridge, Department of Public Works.

NORFOLK, VA., 1800 tons, highway bridge over south branch of Elizabeth River; Atlantic Structural Steel Co., low bidder.

PANAMA CITY, FLA., 4000 tons, bridges across East and West Streets, Andrews Bay; bids close July 7.

SOUTH CHARLESTON, W. VA., 200 tons, additions to boiler house for Carbide & Carbon Chemical Corporation.

OLD HICKORY, TENN., 1500 tons, bridge across Cumberland River; bids close July 1.

CINCINNATI, 300 tons, caissons for Chesapeake & Ohio bridge over Ohio River.

PORTSMOUTH, OHIO, 700 tons, Masonic Temple; general contract to H. M. Blagg Co., Dayton, Ohio.

BUFFALO, 120 tons, Agricultural Chemical Co., new plant; bids asked.

ROYAL OAKS, MICH., 500 tons, theater.

SOUTH BEND, IND., 500 tons, theater.

INDIANAPOLIS, 500 tons, office building.

MILWAUKEE, 500 tons, theater.

SANTA MARIA, CAL., 210 tons, municipal pipe line.

SAN PEDRO, CAL., 625 tons, City Hall, Union Iron Works of Los Angeles, low bidder.

SAN FRANCISCO, 200 tons, bridge for Southern Pacific Co. over the Calaveras River.

SAN FRANCISCO, 6000 tons, 54-in. pipe line from San Andreas to the Laguna Honda reservoir, for the Spring Valley Water Co.; plans being completed, no date set for bids.

CLACKAMAS, ORE., 200 tons, municipal stand-pipe; bids July 6.

Coast Guard Cutters Taking 4000 Tons of Steel Placed

WASHINGTON, June 28.—The Bethlehem Shipbuilding Corporation has been awarded a contract to build five coast guard cutters, involving approximately 800 tons of steel each, of which about 75 per cent will consist of plates and the remainder of shapes. The Bethlehem bids were \$634,500 and \$634,800, the former in case each of the vessels is equipped with Westinghouse machinery and the latter in the event the first three vessels are so equipped and similar machinery is installed in the remaining three. Bids for the machinery will be opened on July 1.

The Higgins-Bothwell Co., Detroit, representing manufacturers of cold finished steel products, has moved its offices from the Dime Bank Building to 614 Free Press Building.

REINFORCING STEEL

Awards Total 3700 Tons—Bridge at Cincinnati Will Take 1500 Tons

The week's awards of concrete reinforcing steel, totaling only 3700 tons, were made up mostly of small lots. Of the 3300 tons of new work under negotiation, 1500 tons is for a bridge over the Ohio River at Cincinnati. Awards follow:

NEW YORK, 500 tons, loft building, 216 East Forty-fifth Street, from Turner Construction Co., general contractor, to Jones & Laughlin Steel Corporation.

NEW YORK, 250 tons, Riverside Drive Viaduct; foreign steel reported purchased by P. T. Cox Contracting Co., general contractor.

BROOKLYN, 200 tons, E. A. Laboratories, to Concrete Steel Co.

BROOKLYN, 130 tons, Fox theater, to Fireproof Products Co.

JAMESTOWN, N. Y., 100 tons, S. M. Flickinger warehouse, to a Buffalo maker.

PITTSBURGH, 150 tons, bridge for Monongahela Connecting Railroad Co., to Kalman Steel Co.

TOLEDO, OHIO, 300 tons, Woodward High School, to Jones & Laughlin Steel Corporation.

CLEVELAND, 200 tons, warehouse for International Harvester Co., to Bourne-Fuller Co.

CHICAGO, 200 tons of rail steel, Milk Dealers Bottle Exchange, to Joseph T. Ryerson & Son.

CHICAGO, 830 tons, three buildings from E. P. Stranberg, contractor, Kalman Steel Co.

CHICAGO, 200 tons of rail and billet bars, addition to garage at 332 South Franklin Street, to Olney J. Dean & Co.

CHICAGO, 300 tons, Engineers Building, to Kalman Steel Co.

CHICAGO, 160 tons, public school, to Concrete Steel Co.

CHICAGO, 100 tons, apartment building at Seventy-second Street and Ridgeland Avenue, to Concrete Engineering Co.

CHICAGO, 100 tons rail steel, apartment building at Diversey Boulevard and Lincoln Avenue, to Calumet Steel Co.

CHICAGO, 100 tons of rail steel, apartment building on Phillips Avenue, to Kalman Steel Co.

OAKLAND, CAL., 600 tons, Oakland High School, Hopkins Street and Park Boulevard, to Frederick Steel Co., Alameda, Cal.

OAKLAND, 200 tons, bridge over the Calaveras River, for Alameda County, to an unnamed San Francisco jobber.

SACRAMENTO, CAL., 200 tons, paving work for the State Highway Commission, to Edward L. Soule Co., San Francisco.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 500 tons, building at 436 East Tenth Street for F. H. Bennett Hiscuit Co.; Turner Construction Co., general contractor.

NEW YORK, unstated tonnage, building for National Urn Bag Co., 140th Street and Southern Boulevard; Turner Construction Co., general contractor.

UNION CITY, N. J., 100 tons, building for Schwarzenbach Brewing Co.

CINCINNATI, 1500 tons, bridge across Ohio River for Chesapeake & Ohio Railway.

CHICAGO, 160 tons, Marquette public school.

CHICAGO, 160 tons, Stone public school.

CHICAGO, 400 tons, apartment building at 1246 Pratt Boulevard.

CHICAGO, 400 tons, South Shore Beach apartment; R. S. DeGolyer, architect.

OAK PARK, ILL., 100 tons, field house. Warner Construction Co., general contractors.

ST. LOUIS, 160 tons, Delmar Boulevard grade crossing.

ST. LOUIS, 325 tons, Civil Court House.

Application for Lower Pig Iron Rate from Sharpsville, Pa., to Butler Denied

The Pennsylvania Public Service Commission has decided against the Sharpsville Furnace Co. in its petition for a reduction in the pig iron freight rate from Sharpsville, Pa., to Butler, and the present rate of \$1.64 per gross ton from that point and other Valley points to Butler is sustained on the ground that the commission at this time did not see the wisdom or advisability of disturbing the group rate applying to all Valley points. The Sharpsville Furnace Co. plans to ask for a rehearing of the case.

PERSONAL

E. E. Norquist, who has been elected president and general manager of the Butler Mfg. Co., Kansas City, Mo., succeeding Charles R. Butler, recently made chairman of the board, was one of the original incorporators of the company and has been associated with it continuously since 1901. Until the last few years, Mr. Norquist has been engaged largely in the manufacturing end of the business, serving from its beginning as plant engineer. More recently he became first vice-president and plant manager, and in that capacity has become fully conversant with the executive policies of the company.



E. E. NORQUIST

M. J. London, who has been Detroit district manager Pittsburgh Steel Products Co., has been transferred to Pittsburgh as district manager. His successor in Detroit is Thomas F. Thornton, for 13 years purchasing agent Detroit Steel Products Co. and later president Roehm Steel Rolling Mills, Detroit. Lately he has been a manufacturers' agent, handling automotive products.

Charles Lanier Lawrence, president Wright Aeronautical Corporation, Paterson, N. J., and designer of the Wright Whirlwind motor, was given the honorary degree of Master of Arts at the 226th commencement of Yale University.

J. M. Price, president Electro Metallurgical Sales Corporation, 30 East Forty-second Street, New York, returned June 21 on the Majestic from an extended vacation in Europe.

L. P. Henderson, formerly in the Detroit office of the Lincoln Electric Co., Cleveland, has been transferred to Chicago and placed in charge of welder service. J. E. Durstine has been removed from the experimental engineering department to the welder service department at Cleveland. J. W. Shugars of the time study department at Cleveland and R. D. Layman, also of the Cleveland office have been moved to Detroit and placed under the direction of J. M. Robinson. D. H. Carver has gone from the machine shop division at Cleveland to the Ohio service division with headquarters at Cincinnati. R. F. Terrill has been transferred from the general engineering department at Cleveland to the Eastern service division with headquarters at New York.

F. S. Earnshaw has terminated his connection with the Jean Caro Products Co., Freeport, Ill., manufacturer of household brushes and toys, and, effective July 1, will become general sales manager of the United States Stamping Co., Moundville, W. Va., maker of enamelware. Prior to his organization of the former company four years ago, Mr. Earnshaw was sales manager of the Illinois Pure Aluminum Co., Lemont, Ill.

E. G. Campbell has been appointed manager of the branch warehouse and sales office recently opened in Cincinnati by Follansbee Brothers Co., Pittsburgh. He was formerly in charge of the Louisville warehouse and sales office and has been succeeded at that branch by C. J. Terstegge.

E. A. Taylor has been appointed manager of the Yellow Sleeve Valve Engine Works, Inc., East Moline,

Ill., a subsidiary of the General Motors Corporation. He has been associated with the company for about four years.

Harry D. Neach, market analyst and director of the development of new products for the Sherman Engineering Corporation, Boston, was the speaker at the June meeting of the Gray Iron Founders' Association in Cleveland.

Gottfrid Olson, for the past 10 years foundry superintendent of the Illinois Malleable Iron Co., Chicago, sailed, June 21, for Stockholm, Sweden, where he will become plan manager of the Pump-Separator Co. He was at one time connected with the Chicago Hardware Foundry Co., Chicago, and with the Manitoba Bridge & Iron Co., Winnipeg, Canada. He is a member of the Swedish Engineers' Society, the American Foundrymen's Association and the Chicago Foundrymen's Club.

E. Standfuss, works manager Harnischfeger Corporation, Milwaukee, has been elected vice-president of the company. He received his engineering training in Saxony and was assistant works manager of a large German shipyard before coming to the United States in 1906. Before going to the Harnischfeger organization in 1920, he was for eight years general superintendent of the Clyde Iron Works Co., Duluth, Minn.

Frank R. Frost, who has been vice-president Superior Steel Corporation, Pittsburgh, since Jan. 1, 1924, has been elected president to succeed R. Edson Emery, who recently resigned, and J. S. Hammond, who has been assistant to the vice-president in charge of sales, has been elected vice-president. Mr. Frost has been



FRANK R. FROST



J. S. HAMMOND

identified with the company since July 1, 1917, serving successively as salesman, assistant sales manager, general manager of sales and vice-president in charge of sales. He was graduated from Allegheny College in 1905 and before joining the Superior Steel Corporation had been engaged in the steel bedstead and tubing business as a plant manager and in charge of purchases. For a time following his graduation from college he was engaged in engineering and construction work. Mr. Hammond has been with the company since just after his graduation from Princeton in 1915. He was head of the schedule and service department, before he entered the sales department. He has been a director of the company since 1922.

Laurence R. Wilder has resigned as president of the American Brown Boveri Electric Corporation, New York, and will become chairman of the advisory committee of the shipbuilding division. Maurice L. Sindband, a vice-president, has been placed in charge of electrical operations.

Franklin R. Fetherston was elected secretary-treasurer of the Compressed Gas Manufacturers' Association, Inc., 120 West Forty-second Street, New York, at its annual summer outing held recently at Absecon, N. J. He succeeds John H. Luening, who is to become associated with the Kentucky Oxygen-Hydrogen Co., Louisville. Mr. Fetherston has acted as engineer with the North Jersey District Water Supply Commission and was previously works manager of the New Jersey Concentrating Co. and the New Jersey Metal Salts Co.

Rudolph B. Flershem, vice-president and general manager of sales for the American Radiator Co., has been appointed vice-president of the Marine Trust Co., Buffalo, and will assume his new duties on Sept. 1. On July 15 the sales executive offices of the Radiator company will be removed from Buffalo to New York, but Mr. Flershem will remain in Buffalo and will continue with the company only in an advisory capacity. He became associated with the American Radiator Co. in 1901 as a salesman in the St. Louis office, later becoming assistant manager, first of the Minneapolis and later of the New York office. Subsequently he was made assistant general manager of sales and some years ago became vice-president and general manager of sales in charge of the coordination of the sales and manufacturing departments.

R. Edson Emery has resigned as president of the Superior Steel Corporation, Pittsburgh, and for the present will devote his time to personal interests. He is not, however, retiring from the steel business, with which he has been identified in operating and executive capacities for the past 27 years, and will announce a new connection at an early date. His leaving the Superior corporation, of which he has been president for the past five years, on June 27, was marked by cordial expressions of esteem by the officers and employees of the company, which took tangible form in the presentation of a gold watch by plant employees, a chain to go with it, by the office force, and a pair of amethyst cuff links, presented by James H. Hammond, chairman of the board, on behalf of the official associates of Mr. Emery. Before joining the Superior corporation in 1922 he had been identified with the Crucible Steel Co. of America for 22 years, and when he left that company was Pittsburgh district mill manager in charge of the Labelle, Singer, Nimick, Park and Crescent works in Pittsburgh and the Norwalk works, Norwalk, Ohio.

Walter H. J. Taylor, since 1916 professor of chemistry at St. Johns University, Shanghai, China, has been appointed assistant professor of chemical engineering at the Carnegie Institute of Technology, Pittsburgh. He was educated at the University of Virginia, Massachusetts Institute of Technology and Columbia University. On leaving the Massachusetts school, he was engaged for four years in the research laboratory of the American Sheet & Tin Plate Co.

Benjamin Talbot Made President of British Manufacturers

At the annual general meeting of the National Federation of Iron and Steel Manufacturers held June 16, in London, England, Benjamin Talbot, deputy chairman and managing director of the Cargo Fleet Iron Co., and the South Durham Steel & Iron Co., Ltd., and several other iron and coal companies in the North Eastern area, was elected president for the year 1927-1928 in succession to H. C. Bond. E. J. Fox, the managing director of the Stanton Iron Works, was elected an additional vice-president.

Instructions for making thermit welds, the first of a series of training courses for electric arc, gas, resistance and thermit welders, have been prepared by the educational committee of the American Welding Society, 33 West Thirty-ninth Street, New York. Copies are obtainable at 50c. each. When all of the four courses have been published they will be available in book form at \$3 per copy.

OBITUARY

CHARLES W. BRYAN, since 1911 chief engineer American Bridge Co., New York, died on June 25 in the New Rochelle Hospital, following a short illness. He had



CHARLES W. BRYAN

been in charge of the engineering on all the principal structures erected recently by the Bridge company, particularly the Hell Gate bridge at New York, the Philadelphia-Camden bridge and the Carquinez Straits structure in California. Mr. Bryan was born at Washington, Mo., in 1863, and was graduated in civil engineering from Washington University, St. Louis, in 1884. After leaving college he was associated for a short time with C. Shaler Smith, St. Louis, one of the leading bridge builders of that period. In November, 1884, he went with the Edge Moor Iron Co., Wilmington,

Del., as a draftsman, remaining with the company until 1887, when he was for a time bridge engineer for the Missouri Pacific Railroad. He soon returned to Wilmington as engineer of the designing and estimating office of the Edge Moor Bridge Works. Later he became chief engineer of the company, holding that position when the Edge Moor company became a part of the American Bridge Co. He next went to Pittsburgh in charge of contracting for highway and railroad bridges in that district, returning to New York in 1901 as Eastern division contracting manager. In 1906 he was made chief engineer of the American Bridge Co. of New York, at the same time retaining his previous position, and in February, 1911, was appointed to the position he held at the time of his death. He was a member of the American Society of Civil Engineers, the American Iron & Steel Institute and the Engineers Club, New York.

HENRY P. TALBOT, dean of the Massachusetts Institute of Technology, Cambridge, Mass., died on June 18 at his home in West Newton, Mass. Under the terms of his will, his wife is to receive the income from his estate for the remainder of her life, after which, excepting certain private bequests, the institute is to receive the residue, a part of which Mr. Talbot suggested should be used by junior members of the faculty in keeping in touch with the technical societies representing their professions.

ROBERT A. KEASBEY, president and general manager of the Robert A. Keasbey Co., 445 West Street, New York, maker of heat insulating materials, died on June 22 at his home in Roseland, N. J. He was in his seventieth year.

JOHN M. GOODELL, formerly editor of *Engineering Record*, died on June 22 at the French Hospital, New York. He was born at Worcester, Mass., in 1867, and in 1888 was graduated from the Worcester Polytechnic Institute. Two years later he joined the staff of *Engineering News*, later becoming an associate editor of *Engineering Record*. After a brief interval as assistant secretary of the American Society of Civil Engineers, he returned to *Engineering Record* in 1897 as editor. When that paper was purchased by James H. McGraw in 1903, he joined the staff of Joseph H. Wallace as resident engineer on paper mill construction at Sault Ste. Marie. The following year he again became editor of the *Record*, holding that position until 1912,

or about the time it was merged with the *Engineering News*. Shortly afterward he was instrumental in the establishment of the American Highway Association. During the World War he served as employment manager, first of the production division and later of the entire Emergency Fleet Corporation. In the last year of the war he was acting chairman of the National Highway Council. More recently he was consulting engineer to the Bureau of Public Roads and later was engaged in special service for the Babcock & Wilcox Co., New York, and edited the *Journal of the American Waterworks Association*.

ENOCH PETERSON, president of the William D. Gibson Co., Chicago, manufacturer of steel springs, died on June 9 at his home in that city.

JULIUS SCHUENGEL, general superintendent Geuder, Paeschke & Frey Co., Milwaukee, died on June 22. He was 46 years of age, and had spent 30 years in the employ of the Milwaukee company, having been successively assistant purchasing agent, assistant general superintendent and general superintendent.

BRADFORD MCINTYRE, Southeastern traveling representative of the Pittsburgh Screw & Bolt Corporation, Pittsburgh, died at Miami, Fla., on June 8, following a very brief illness. He was 47 years of age.

WALTER NATHAN CRAFTS, since 1924 works manager at the Reading, Pa., plant of the Reading Steel Castings Co., Inc., Bridgeport, Conn., died on June 8, aged 55 years. He was graduated from Oberlin College, Oberlin, Ohio, and from the Massachusetts Institute of Technology, completing his work at the latter institution in 1895. He was for a time superintendent of the Sharon, Pa., plant, American Steel Foundries, and later was part owner and manager of the Crucible Steel Forge Co., Cleveland. During the war period he was general manager of British Forgings, Ltd., Toronto, and from 1920 until 1924 he was president and general manager of Canadian Electric Steel, Ltd., Montreal.

WILLIAM NEWELL, sales manager in Philadelphia of the shipbuilding division of the Bethlehem Steel Corporation, died in his home in that city June 23. He was 35 years old. He had been away from the office for two or three months, due to a nervous breakdown.

DR. EUGENE HAANEL, for 20 years superintendent and director of the Canadian Department of Mines, died on June 26 in Ottawa, Ont., in his eighty-seventh year. He was born in Germany, but came to the United States as a young man where he served in the Union army during the Civil War. From 1888 until 1901 he served on the faculty of the department of physics at Syracuse University, Syracuse, N. Y., specializing in research on mining. Later as a member of the faculty of Victoria University, Coburg, Ont., he founded Faraday Hall, the first science hall in Canada. In 1903 and 1904 he was head of a commission appointed to investigate the electro-thermic processes for the smelting of iron ores and making of steel. He was a member of the American Institute of Chemical Engineers.

JAMES W. BROWN, vice-president Western Machine Co., Milwaukee, died on June 19, following a short illness. He was born at Grand Rapids, Mich., in 1865 and went to Milwaukee in 1893, where he was for 25 years associated with the Chain Belt Co. He resigned to aid in the organization of the Western company, manufacturer of special machinery, tools and appliances.

PROF. CHARLES F. MABERY, for 35 years head of the laboratory of the Standard Oil Co., died on June 26 in a hospital at Portland, Me., aged 77 years. He received his bachelor's and doctor's degrees at Harvard University, where he was an instructor in chemistry for four years before becoming professor of chemistry at the Case School of Applied Science, Cleveland, where he served for 27 years.

KINTARO HEMMI, general manager of the iron and steel department of Mitsui & Co., Ltd., Tokio, died sud-

denly June 15. He was 57 years of age and had been with Mitsui & Co. for about 25 years. Following his graduation from the University of Industry, Kuramaye, Tokio, Mr. Hemmi was appointed engineer of the Imperial naval station at Kure, Japan, and later, as an inspector, he resided in Germany, France and England. For many years he was head of the engineering department of Mitsui & Co. Just prior to his death he had been elected a director of the company.

LELAND M. TURNER, formerly president and chief engineer Turner Mfg. Co., Port Washington, Wis., maker of gasoline engines, and later general manager of the Western Malleable & Gray Iron Co., Waterloo, Iowa, died June 9 following an operation. He was born in Milwaukee 54 years ago.

CLAUDIN D. PRIOR, chief engineer of the power plant and maintenance department, Cutler-Hammer Mfg. Co., Milwaukee, died June 10 following a stroke of apoplexy. He was 50 years of age and had been associated with the Cutler-Hammer company since 1916.

MICHAEL SEEBOTH, secretary-treasurer Seeboth Brothers Co., Milwaukee, and of the Milwaukee Bronze Casting Co., died June 15. He was born in Germany 75 years ago and had resided in Milwaukee since 1873.

Using Direct Metal in Foundry

(Concluded from page 1872)

content. A more uniform analysis than is attained in ordinary cupola practice is attributed to the absence of conditions that exist in regular cupola operations, as the result of which every ladle of cupola iron may vary slightly in analysis. In the case of ordinary cupola iron, it is pointed out, the charge is mixed in the cupola well, holding about two tons, and may not be thoroughly mixed. As compared with this mixing of a small amount, there is a large amount of metal mixed in the mixer and this is more thoroughly mixed by decanting and then going through the electric furnaces.

It is also stated that there is not the danger, as in ordinary cupola practice, that the sulphur content will be increased, as no fuel is used after the iron is first melted. Also, the oxidizing condition which has a tendency to increase the sulphur content is avoided. Iron made by the process has run as low as 0.06 per cent in sulphur, but the average sulphur content is 0.08 per cent, as compared with 0.09 to 0.10 per cent in the regular cupola practice.

Scrap from the foundry and machine shop is carried on two conveyors to the charging floor, which is located on the fourth floor of the foundry, or one floor above the regular charging floor. The discharge from each conveyor is into two hoppers which empty into one-ton cupola charging cars. The steel scrap is delivered on the same conveyors. The scrap is weighed on automatic scales and is dumped automatically into the cupola. Coke from the coke ovens is brought on a conveyor to a coke bin above the charging floor, from which the fuel is discharged into the charging cars.

Slag from the cupola is discharged through a slag spout over which there is a continuous spray of water. This reduces the slag to granular form. Slag from all the cupolas is now broken up in this manner and it is stated that this method has resulted in a labor saving of 75 to 100 men employed in breaking up slag. The slag is loaded on railroad cars and is used for ballast on the Detroit, Toledo & Ironton Railroad.

Several cases of the use in school buildings of the Junior beams made by the Jones & Laughlin Steel Corporation have recently been noted. These include some 330 tons for the administration building for the Board of Education, Pittsburgh, 188 tons for a high school building at Asheville, N. C., and 53 tons for a high school building at Martinsburg, W. Va.

Quiet Rules European Steel Markets

Cartel Quota Unchanged—Germans Expanding in Open-Hearth Steel—Japanese Readjustments

(By Cable)

LONDON, ENGLAND, June 27.

PIG iron is quiet and with the holiday season approaching little revival is expected for several weeks. Cleveland producers are maintaining their prices although Continental iron is arriving at Grangemouth at £3 7s. 9d. (\$16.42) per ton.

Bolckow, Vaughan & Co. are transferring one furnace from foundry to ferromanganese production. Hematite demand has improved and some export sales have been effected, but stocks are still heavy and competition is keen. There is a good demand for foreign ore. Germany bought heavily for 1928 delivery, but British users are purchasing only moderately.

Finished iron and steel are quiet. With plate and some sectional mills in need of orders, makers are quoting the official minimum prices. Domestic demand is light, as consumers are occupied with recent de-

liveries, which in some cases are shipments several months in arrears. Export is quiet, but Australia has purchased a fair tonnage of plates.

Tin plate is dull and only about 60 per cent of the Welsh mills are operating. Consumers are purchasing against immediate requirements and the position of makers is most unsatisfactory.

Galvanized sheets are moderately active in small lots, but substantial demand is lacking. Black sheet demand from Japan is rather better, but substantial sales are slow in developing.

British users of Continental semi-finished material are showing more interest and have purchased billets and sheet bars at about the ruling prices. Other Continental material is dull. The Belgian output in May was 318,800 tons of pig iron and 314,000 tons of steel ingots. The Acieries Reunies de Burbach-Eich-Dudelange is considering modernizing its Dudelange plant.

JAPANESE FINANCES UNSETTLED

Readjustment Being Made But Large Debts and Small Profits of Steel Companies Serious

TOKIO, JAPAN, June 2.—The financial troubles, culminating in the moratorium which ended at midnight of May 12, have placed fresh emphasis upon the exceedingly unhealthy condition of the steel industry.

The outstanding example is the Kawasaki Dockyard Co., which operates one of the largest shipbuilding yards in the country, controls shipping lines and is responsible for more than half the thin sheet output of Japan. The Kawasaki Dockyard was involved in the crash of the Fifteenth Bank, perhaps being largely responsible for the financial trouble of that institution. Another steel company which has encountered difficulties is the Kobe Steel Works, a subsidiary of the Suzuki interests.

The market just at present is firm, due to the decline of the yen from \$49 to \$46 per 100 yen and the

unwillingness of the banks to finance large imports of steel. However, the situation is doubtful and many lines are marking time. The future of the steel business for the next three or four months is difficult to forecast. A great deal depends on the movement of the yen, as with the yen low it does not pay to import. Briefly, the history of the March and April financial troubles was as follows:

During the war and post-war activity, with imports curtailed, Japan's industry expanded. This was especially true of steel. But when European mills returned to the Japanese market Japanese companies in many lines, particularly in steel, could not profit. Many suspended and others entered into mergers. Most, however, tried to continue in business.

Japanese companies appear to consider dividends as they do wages. Regardless of business they must be paid and must be large. With no profits coming in, dividends were borrowed from the banks, many of which were founded by industrialists, existing largely to aid their owners. The Government assisted this process, granting subsidies, increasing tariffs and ex-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £ as follows:

Durham coke, del'd.	£1 1s.		\$5.09
Bilbao Rubio ore†	1 1½	to £1 2s.	5.27 to \$5.33
Cleveland No. 1 fdy.	3 12½		17.57*
Cleveland No. 3 fdy.	3 10		16.97*
Cleveland No. 4 fdy.	3 9		16.73*
Cleveland No. 4 forge	3 8½		16.61*
Cleveland basic	3 15	to 3 15½	18.18 to 18.30
East Coast mixed	3 17½		18.78
East Coast hematite	3 18		18.90
Rails, 60 lb. and up.	7 15	to 8 5	37.58 to 40.01
Billets	7 5	to 7 10	35.16 to 36.37
Ferromanganese	12 0		58.20
Ferromanganese (export)	11 15		56.98
Sheet and tin plate bars, Welsh	6 5		30.31
Tin plate, base box	0 18¾	to 0 19¼	4.54 to 4.66
Black sheets, Japanese specifications.	14 0	to 14 5	67.90 to 69.11
C. per Lb.			
Ship plates	7 12½	to 8 0	1.65 to 1.73
Boiler plates	10 10	to 11 0	2.27 to 2.38
Tees	8 2½	to 8 12½	1.75 to 1.87
Channels	7 7½	to 7 17½	1.60 to 1.70
Beams	7 2½	to 7 12½	1.54 to 1.65
Round bars, ¾ to 3 in.	8 0	to 8 10	1.73 to 1.84
Steel hoops	10 10	to 11 0	2.28 to 2.39
Black sheets, 24 gage	10 15		2.32
Galv. sheets, 24 gage	14 5	to 14 15	3.09 to 3.19
Cold rolled steel strip, 20 gage, nom.	14 0		3.03

*Export price, 6d. (12c.) per ton higher.

†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron: (a)			
Belgium	£3 2s.	to £3 3s.	\$15.03 to \$15.28
France	3 2	to 3 3	15.03 to 15.28
Luxemburg	3 2	to 3 3	15.03 to 15.28
Basic pig iron:			
Belgium	3 0	to 3 1	14.55 to 14.79
France	3 0	to 3 1	14.55 to 14.79
Luxemburg	3 0	to 3 1	14.55 to 14.79
Coke	0 18		4.37
Billets:			
Belgium	4 6	to 4 8	20.85 to 21.33
France	4 6	to 4 8	20.85 to 21.33
Merchant bars:			
Belgium	4 12½		1.01
France	4 12½		1.01
Luxemburg	4 12½		1.01
Joists (beams):			
Belgium	4 14		1.03
France	4 14		1.03
Luxemburg	4 14		1.03
Angles:			
Belgium	4 15		1.04
½-in. plates:			
Belgium (nominal)	6 6		1.38
Germany (nominal)	6 6		1.38
¾-in. ship plates:			
Belgium	5 17		1.28
Luxemburg	5 17		1.28
Sheets, heavy:			
Belgium	6 1		1.33
Germany	6 1		1.33

(a) Nominal.

tending aid to semi-official institutions. Realty values remained high, while labor and other production costs continued close to their wartime levels. No attempt was made to deflate and place industry on an economic basis. Consequently, business continued piling up debts and awaiting the revival of trade that was always expected to develop.

The effects of the panic of 1920 were intensified by the earthquake of 1923. Generally speaking, the companies which suffered from the earthquake merely wrote up the value of property and continued without readjustment. The yen declined in 1924 and until October, 1925, remained at about \$40 per 100 yen. Business enjoyed an artificial prosperity and talk of radical readjustments gradually ceased.

In October, 1925, however, the yen began to advance as a result of speculation abroad. By December, 1926, it had reached \$49.25 per 100 yen, only a point below gold parity. Profits decreased and company debts increased, so that business was resting on a decidedly shaky foundation. In March, publicity in the Diet regarding the conditions of certain banks started a series of runs and a dozen fairly large second-class banks closed, but the Bank of Japan was able to stop the runs by extending loans. In April the Government decided to readjust the Bank of Taiwan, the semi-official institution which has the right of note issue for Formosa. As the Suzuki interests owe the Bank of Taiwan more than 450,000,000 yen (about \$225,000,000), this company was embarrassed. The Bank of Taiwan and other banks refused to finance its operations. Then private banks shut down on the Bank of Taiwan, calling their loans. The Privy Council refused to sanction the Cabinet's plans to aid the distressed bank and on April 17 it closed all its branches outside Formosa. In the days that followed bank failures followed close on each other as runs broke out everywhere. On April 21 the great Fifteenth Bank of Tokio closed. Late that night all the banks suspended for two days. On April 22 a 21-day moratorium was declared. During the moratorium the Imperial Diet, meeting in special session, guaranteed the Bank of Japan's advances to the Bank of Taiwan and private institutions to the extent of 700,000,000 yen.

After the moratorium the country was calm. The emergency advances were not needed. But more than 700,000,000 yen were tied up in banks which had closed their doors. Moreover, bank failures had practically forced suspensions of dozens of industrial companies. The cotton knit goods trade had had its hands tied by the suspension of the Omi Bank of Osaka. The closing of the Fifteenth Bank removed the support needed by the Kawasaki Dockyard Co., Kokusai Steamship Co., Kawasaki Steamship Co., Tokiwa Industrial Co., and other so-called Matsukata interests. Nobody wanted to aid the Suzuki interests and about 60 companies were more or less embarrassed.

Today readjustment plans are going ahead, but in general they do not involve real changes.

The condition of the Kawasaki Dockyard Co. is an illustration of the general situation. This company is capitalized at 90,000,000 yen, of which about 63,000,000 yen are paid up. It has assets which it values at 323,000,000 yen. A partial Government appraisal has placed the value of these assets at less than 142,000,000 yen. Its debts total 181,000,000 yen. For four years following the panic of 1920 it paid 15 per cent dividends. Since then it has been paying 10 per cent. The Fifteenth Bank had loaned money to other Matsukata interests against the stock of the dockyard company. In order to protect this security (stock market prices seem entirely based on dividends in Japan), it loaned the Kawasaki Dockyard the money to pay dividends. The Government is much concerned about the Kawasaki Dockyard, as two cruisers and four submarines are now on its ways. Government aid to the extent of about 30,000,000 yen has been promised.

The Kobe Steel Works recently managed to float a loan of 3,000,000 yen by mortgaging its stocks and raw materials and has just reopened, after a long suspension. The company, capitalized at 20,000,000 yen, fully paid up, some time ago purchased the Harima Dockyard Co., and the Toba Shipbuilding Co., from the Suzuki interests, the parent concern. For these it gave promissory notes for 24,000,000 yen. When it encountered financial difficulties, the Suzuki Shoten

Kaisha discounted these with the Bank of Taiwan. Now the bank wants its money and has suggested that the Kobe Steel Works issue serial bonds, falling due each year for 20 years. The plan still is under consideration.

Yesterday the Asano Dockyard at Tsuruga blew in a new 150-ton blast furnace and on Aug. 1 it expects to begin operation of a new 50-ton open-hearth furnace.

STEEL CARTEL MEETS

Quota Unchanged for Third Quarter—German Fines Reduced and Exports Limited

HAMBURG, GERMANY, June 12.—The meeting of the International Steel Cartel, June 9 to 10 in Luxembourg, was almost without result. The allotments for the third quarter have been left unchanged and the formation of subsidiary associations to control separate products made no progress. The meeting did consider the German request for an increase in the allotment necessary to meet the requirements of the present active German domestic market. It is understood that the fine of \$4 per ton for overproduction was reduced in the case of Germany to \$2 per ton, with the understanding that Germany in return for this concession would limit exports of steel to 320,000 tons a month in the next quarter. This would be about 120,000 tons below the March exports and about 70,000 tons below the April figure. The reduction of exports is said to apply especially to beams and bars.

Formation of subsidiary cartels to control different products was prevented by the insistence of the French and Belgian mills that their allotments should be increased by 10 per cent. Efforts to form such cartels, however, have not been abandoned and those interested in forming these associations are now looking forward to the next meeting of the International Steel Cartel in September.

The question of entry of Poland into the international cartel was brought up by the representative of the All-Poland Steel Syndicate, but as the Polish demand is still for an allotment that is about 100 per cent greater than the actual production of the country, none of the other members regarded the Polish proposal seriously.

FRENCH MARKET QUIET

Exports Light But Production Remains High—British Competition in Pig Iron

PARIS, FRANCE, June 17.—Since the slight revival in export business a few weeks ago, the market has been quiet, and the tendency is again toward lower prices. This is probably partly the result of the curtailment of business with Japan and China and continued high production authorized by the International Steel Cartel. Another depressing factor is the failure of the recent meeting of the cartel to agree on the formation of separate sales syndicates for bars and beams. Although the domestic market is fairly steady, concessions would undoubtedly appear if there were any desirable tonnages under consideration. Recent reports that there may be an increase in the value of the franc, accomplished by official reduction of the volume of paper money in circulation, have caused some apprehension. However, should this be done concurrently with a reduction in the cost of living, the result might be desirable. It is noteworthy that statistics for May show that wholesale prices of most commodities registered a decline while retail prices continued to increase.

Pig Iron.—At the meeting of phosphoric foundry iron producers, June 16, it was pointed out that, although there was a definite improvement in domestic demand, it was not sufficiently marked to justify any increase from the June allotment of 30,000 tons placed at the disposal of foundries. In consequence, the tonnage available and the price for July will probably continue unchanged. The hematite iron producers, however, at a recent meeting decided that there had been sufficient improvement in demand to justify an

increase in the June allotment from 30,000 to 32,000 tons and the establishment of a 35,000 ton allotment for July with 20,000 tons estimated for the August requirement. As a result of British competition on hematite grades it was decided to reduce prices from 15 to 20 fr. (60c. to 80c.) per ton. The entente of hematite iron producers, which expired June 30, has been renewed. Export of pig iron has declined to a low level and British competition is keen. For export, No. 3 foundry is quoted at £3 7s. 6d. (\$16.36) per gross ton, f.o.b. Antwerp, but some sellers have gone as low as £3 1s. to £3 5s. (\$14.79 to \$15.76) per gross ton. A recent sale to England is definitely reported to have been at £3 2s. 6d. (\$15.15) per gross ton. The International Ferrosilicon Syndicate is meeting keen competition from non-members in Britain and Austria.

Semi-Finished Material.—The domestic market is quiet and exports have declined in the past week. No export transactions of any size are reported and prices are nominally £4 2s. to £4 5s. (\$19.88 to \$20.61) per metric ton, f.o.b. Antwerp, for blooms. There is a small demand for billets, which range from £4 7s. to £4 9s. (\$21.09 to \$21.58) per ton, and slabs are about £4 10s. (\$21.82) per ton.

Finished Material.—Except for recent government purchases of steel, the market is quiet. Merchants show but little interest unless large concessions are offered. Demand for beams is light in the domestic market as a result of the keen competition being offered by reinforced concrete construction. For export the market ranges from £4 13s. to £4 16s. (1.02c. to 1.06c. per lb.) per metric ton, f.o.b. Antwerp. Bars range from £4 14s. to £4 14s. 6d. (1.03c. to 1.04c. per lb.) per metric ton, f.o.b. Antwerp. Deliveries offered by mills are from four to six weeks in some cases. The International Wire Rod Syndicate is quoting wire rods at £5 12s. 6d. (1.23c. per lb.) per ton, f.o.b. Antwerp, an advance from the former price of £5 7s. 6d. to £5 7s. 10d. (1.18c. per lb.) per ton.

German Use of Open-Hearth Steel Increasing

HAMBURG, GERMANY, June 12.—In Germany, contrary to the situation in other Continental countries, although rather high extras are charged for open-hearth steel over the price of Thomas grade, there is an increasing consumption of the open-hearth product. The usual mill extra on bars, beams, and plates is 5 m. per metric ton, about \$1.20, and merchants selling from stock generally charge from \$1.40 to \$1.80 per ton more for open-hearth. As a large proportion of consumers purchase their requirements from stock these higher extras probably more nearly represent the cost to the buyer. In the case of wire rods, the merchants usually ask an extra of as much as \$2.25 per metric ton and on bolt and rivet stock \$2 is the usual extra with the hoop extra for open-hearth material ranging up to \$2.50 per ton and more. Despite this situation there is an increasing number of contractors and other consumers specifying the use of open-hearth steel in the products they purchase. Despite the higher cost and guarantees of the tensile strength of Thomas steel, the consumption of open-hearth is increasing.

Exports of finished manufactures and of semi-finished manufactures from the United States in the four months ended April 30 showed a gain of about 2 per cent over the corresponding period of last year. Exports of crude materials, including foodstuffs and animals, showed a gain of 24 per cent over the first four months of 1926. Imports of finished and semi-finished manufactures declined more than 10 per cent.

"Schools undertaking to make an engineer in three to six months, out of anyone who has the price," are being attacked by the American Association of Engineers, 63 East Adams Street, Chicago. Investigation shows that many are offering obsolete courses, written 15 years ago and never revised, and that four times as many students are enrolled in these institutions as are in attendance at all American colleges and universities.

LESS FOREIGN BEAMS USED

Erectors Buying Only American Sizes—Importers Unable to Dispose of British and Continental Beams

NEW YORK, June 28.—There continues to be a moderate demand in the New York district for foreign structural material of certain sizes, despite the fact that the Borough of Brooklyn has prohibited the use of imported beams in buildings. Current purchasing, however, is almost exclusively of beams rolled strictly to American specifications, erectors being unwilling to risk trouble in other boroughs by use of British or Continental sizes, which until the present situation developed were usually accepted as satisfactory.

As a result of this turn in purchases to strictly American specifications, importers with tonnages of beams not rolled to standard have, in many instances, been unable to dispose of them. In several cases, it is reported that importers with small lots of such material have been forced to stock it at considerable cost, the usual charges being \$2.50 per ton each way for trucking to and from storage yard, 50c. per ton for entry into stock and 50c. per ton for delivery from stock, with 50c. per ton a month storage charge.

Following complaints registered by importers with consular officials of France, Belgium and Germany, in which the importers claimed that foreign steel was being discriminated against by the Brooklyn prohibition on the use of foreign made beams, the Belgian and German consuls have asked for further particulars. In the present case, the German importers are only partially involved, as German mills ship practically no beams to the United States and only a small tonnage of angles, the principal German tonnage being plain and deformed steel bars, which are not included in the Brooklyn decision.

Prices of imported steel are growing firmer, so that on recent inquiries importers, especially those representing German mills, have quoted up to 1.90c. per lb. base and more for open-hearth reinforcing bars. Intermediate grade Thomas steel reinforcing bars range from 1.80c. to 1.85c. per lb., base, delivered New York.

The broker in New York reported to have placed a total of about 1700 tons of open-hearth reinforcing bars for subway construction work with two German mills has apparently been unable to close this business and it is denied by importers said to have booked the orders that any such business was placed, although they submitted quotations.

Japanese Market Quiet

About the only important business from Japan at present is the 29,000 base boxes of oil can tin plate for the Nippon Oil Co., bids on which were opened last week. Award has not yet been reported. The 40,000 tie plates for the Imperial Government Railways were placed with a large Japanese export house and awarded to an American mill. The 50 miles of 100-lb. rails for the Hanwa Electric Railway in Japan, which have been in the market for several weeks, have not yet been awarded.

European Cast Iron Pipe Cartel in Prospect

HAMBURG, GERMANY, June 12.—At the end of this month negotiations will be entered into by German, French and Belgian producers of cast iron pipe for the establishment of a common export selling price. The Continental markets, according to present intentions, will be distributed to the various makers, but export to overseas countries, particularly the United States, will be left free under sales prices to be established monthly. It is proposed that sellers quoting less than the agreed price be fined.

American shipyards on June 1 were building or under contract to build for private shipowners 221 steel vessels of 192,346 gross tons, compared with 221 steel vessels of 206,337 gross tons on May 1, according to the Bureau of Navigation, Department of Commerce.

Rolled Iron and Steel Made Record in 1926

PRODUCTION of finished rolled iron and steel in 1926 exceeded the highest previous figure—that of 1925—by more than 6 per cent, according to Statistical Bulletin No. 3 of the American Iron and Steel Institute. The amount is given as 35,495,892 gross tons, compared with 33,386,960 tons in 1925. Only two earlier years passed 33,000,000 tons, these having been 1923, with 33,277,076 tons, and 1917, with 33,067,700 tons.

Production of plates and sheets went far ahead of

any preceding record, having reached 10,529,056 tons, compared with 9,807,659 tons in 1925, the previous high mark. Prior to 1925 the record was held by 1923 with 9,497,717 tons.

Structural shapes made another new record with 3,911,663 tons, compared with 3,604,130 tons in 1925, the previous high mark. Prior to 1925 the record was held by 1923 with 3,405,197 tons. The gain was mainly in heavy shapes, which went up from 3,049,817 tons to

TOTAL PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL, 1890-1926.

Years	Iron and steel rails.	Plates and sheets.	Nail plate.	Wire rods.	Structural shapes.	All other finished rolled.	Total Gross tons.
1890.	1,885,307	809,981	251,828	457,099	.....	2,618,660	6,022,875
1891.	1,307,176	678,927	223,312	536,607	.....	2,644,941	5,390,963
1892.	1,551,844	751,460	201,242	627,829	453,957	2,579,482	6,165,814
1893.	1,136,458	674,345	136,113	537,272	387,307	2,104,190	4,975,685
1894.	1,021,772	682,900	108,262	673,402	360,305	1,795,570	4,642,211
1895.	1,306,135	991,459	95,085	791,130	517,920	2,487,845	6,189,574
1896.	1,122,010	965,776	72,137	623,986	495,571	2,236,361	5,515,841
1897.	1,647,892	1,207,286	94,054	970,736	583,790	2,497,970	7,001,728
1898.	1,981,241	1,448,301	70,188	1,071,683	702,197	3,239,760	8,513,370
1899.	2,272,700	1,903,505	85,015	1,036,398	850,376	4,146,425	10,294,419
1900.	2,385,682	1,794,528	70,245	846,291	815,161	3,575,536	9,487,443
1901.	2,874,639	2,254,425	68,850	1,365,934	1,013,150	4,772,329	12,349,327
1902.	2,947,933	2,665,409	72,936	1,574,293	1,300,326	5,383,219	13,944,116
1903.	2,992,477	2,599,665	64,102	1,503,455	1,095,813	4,952,185	13,207,697
1904.	2,284,711	2,421,398	61,601	1,699,028	949,146	4,597,497	12,013,381
1905.	3,375,929	3,532,230	64,542	1,808,688	1,660,519	6,398,107	16,840,015
1906.	3,977,887	4,182,156	54,211	1,871,614	2,118,772	7,383,826	19,588,468
1907.	3,633,654	4,248,832	52,027	2,017,583	1,940,352	7,972,374	19,864,822
1908.	1,921,015	2,649,693	45,747	1,816,949	1,083,181	4,311,608	11,828,193
1909.	3,023,845	4,234,346	63,746	2,335,685	2,275,562	7,711,506	19,644,690
1910.	3,636,031	4,955,484	45,294	2,241,830	2,266,890	8,475,750	21,621,279
1911.	2,874,639	4,488,049	48,522	2,450,453	1,912,367	7,316,990	19,039,171
1912.	3,327,915	5,875,080	46,331	2,653,553	2,846,487	9,908,475	24,656,841
1913.	3,502,780	5,751,037	37,503	2,464,807	3,004,972	10,030,144	24,791,243
1914.	1,945,095	4,719,246	38,573	2,431,714	2,031,124	7,204,444	18,370,196
1915.	2,204,203	6,077,994	31,929	3,095,907	2,437,003	10,546,188	24,392,924
1916.	2,854,518	7,453,980	30,088	3,518,746	3,029,964	15,493,093	32,380,389
1917.	2,944,161	8,267,616	22,864	3,137,138	3,110,000	15,585,921	33,067,700
1918.	2,540,892	8,799,135	18,310	2,562,390	2,849,969	14,385,058	31,155,754
1919.	2,203,843	7,372,814	12,832	2,538,476	2,614,036	10,359,543	25,101,544
1920.	2,604,116	9,337,680	20,577	3,136,907	3,306,748	13,941,835	32,347,863
1921.	2,178,818	4,260,574	14,573	1,564,330	1,272,624	5,483,087	14,774,006
1922.	2,171,776	7,968,397	21,969	2,654,741	2,718,768	10,916,353	26,452,004
1923.	2,904,516	9,497,717	22,833	3,075,892	3,405,197	14,370,921	33,277,076
1924.	2,433,332	8,087,883	22,175	2,522,545	3,283,708	11,736,792	28,086,435
1925.	2,785,257	9,807,659	22,038	2,844,656	3,604,130	14,323,220	33,386,960
1926.	3,217,649	10,529,056	17,337	2,722,032	3,911,663	15,098,155	35,495,892

PRODUCTION OF WROUGHT PIPE AND SEAMLESS STEEL TUBES, INCLUDING BOILER TUBES, GROSS TONS, IN 1926.

Kinds of pipe or tubes.	Lap weld and butt weld pipe or tubes—Gross tons.			Seamless pipe or tubes—Gross tons.		
	Iron.	Steel.	Total welded.	Hot finished.	Cold drawn.	Total seamless.
Black, standard.....	76,648	1,301,099	1,377,747	6,619	627	7,246
Galvanized.....	41,859	484,242	526,101	1,958	.....	1,958
Oil country goods.....	21,568	1,306,726	1,328,294	444,632	1,446	446,078
Mechanical tubes.....	.....	.....	.....	26,393	78,549	104,942
O.D. & miscellaneous.....	.....	109,520	109,520	7,754	33,351	41,105
Boiler tubes.....	19,361	41,492	60,853	133,580	40,420	174,000
Total.....	159,436	3,243,079	3,402,515	620,936	154,393	775,329

PRODUCTION OF SEAMLESS STEEL TUBES, GROSS TONS, 1917-1926.

Years.	Hot finished.	Cold drawn.	Total.	Years.	Hot finished.	Cold drawn.	Total.
1917.....	87,615	139,060	226,675	1922.....	120,652	137,183	257,835
1918.....	142,308	150,586	292,894	1923.....	202,669	201,114	403,783
1919.....	75,864	121,505	197,369	1924.....	131,758	129,399	261,157
1920.....	132,091	159,479	291,570	1925.....	403,965	164,225	*568,190
1921.....	59,663	58,221	117,884	1926.....	620,936	154,393	*775,329

*Includes 162,294 tons of seamless steel boiler tubes in 1925, and 174,000 tons in 1926. Figures for prior years are not available.

PRODUCTION OF CAST-IRON PIPE AND FITTINGS, NET TONS.

Years.	Gas and water.*	Soil and plumbers.	Total.	Years.	Gas and water.*	Soil and plumbers.	Total.
1916.....	934,626	279,707	1,214,333	1922.....	926,577	356,872	1,283,449
1917.....	748,173	250,928	999,101	1923.....	1,134,059	432,828	1,566,887
1918.....	508,300	111,373	619,673	1924.....	1,365,272	476,078	1,841,350
1919.....	514,664	195,417	710,081	1925.....	1,414,252	510,483	1,924,735
1920.....	636,862	249,653	886,515	1926.....	1,534,278	469,228	2,003,506
1921.....	564,138	230,092	794,230	.....	.....	.....	.....

* Includes culvert pipe. † Revised.

PRODUCTION OF PLATES AND SHEETS BY KINDS, 1925-1926.

Kinds.	1925—Gross tons.			1926—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Universal plates*.....	3,001	1,193,020	1,196,021	5,543	1,402,004	1,407,547
Sheared plates—						
Rolled on single stands.....	342	1,930,004	1,930,346	211	2,193,071	2,193,282
Roughed and fin. on sep. stands.....	.....	627,084	627,084	.....	600,353	600,353
Black sheets rolled on sheet or jobbing mills.....	38,216	4,058,616	4,096,832	4,645	4,232,834	4,237,479
Black plates, including black plates for tinning and black plate specialties rolled on tin mills.....	.....	1,957,376	1,957,376	.....	2,090,395	2,090,395
Total.....	41,559	9,766,100	9,807,659	10,399	10,518,657	10,529,056

* Include flats and bars over 6 inches wide.

PRODUCTION OF MERCHANT BARS, SHOWING IRON AND STEEL MERCHANT BARS SEPARATELY, GROSS TONS, 1905-1926.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1905.....	1,322,439	2,271,162	3,593,601	1916.....	993,948	5,236,354	6,230,302
1906.....	1,481,348	2,510,852	3,992,200	1917.....	983,926	5,226,031	6,209,957
1907.....	1,440,356	2,530,632	3,970,988	1918.....	846,898	5,395,851	6,242,749
1908.....	685,233	1,301,405	1,986,638	1919.....	446,549	3,945,075	4,391,624
1909.....	952,230	2,311,301	3,263,531	1920.....	663,032	5,467,208	6,130,240
1910.....	1,074,163	2,711,568	3,785,731	1921.....	198,324	1,367,430	1,565,754
1911.....	835,625	2,211,737	3,047,362	1922.....	317,665	3,660,993	3,978,658
1912.....	944,790	2,752,324	3,697,114	1923.....	404,730	5,148,066	5,552,796
1913.....	1,026,832	2,930,977	3,957,809	1924.....	258,737	4,022,184	4,280,921
1914.....	563,171	1,960,460	2,523,631	1925.....	290,488	5,368,827	5,659,315
1915.....	657,107	3,474,135	4,131,242	1926.....	252,437	5,221,399	5,473,836

PRODUCTION OF SKELF, SHOWING IRON AND STEEL SKELF SEPARATELY, GROSS TONS, 1905-1926.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1905.....	452,797	983,198	1,435,995	1916.....	355,445	2,572,229	2,927,674
1906.....	391,517	1,137,068	1,528,585	1917.....	336,591	2,337,640	2,674,231
1907.....	444,536	1,358,091	1,802,627	1918.....	258,500	2,305,511	2,564,011
1908.....	297,049	853,534	1,150,583	1919.....	192,146	2,363,632	2,555,778
1909.....	370,151	1,663,230	2,033,381	1920.....	252,403	2,967,886	3,220,289
1910.....	350,578	1,477,616	1,828,194	1921.....	115,523	1,815,052	1,930,575
1911.....	322,397	1,658,276	1,980,673	1922.....	218,868	2,653,347	2,872,215
1912.....	327,012	2,119,804	2,446,816	1923.....	216,846	3,517,490	3,734,336
1913.....	312,746	2,189,218	2,501,964	1924.....	165,581	3,004,962	3,170,543
1914.....	264,340	1,718,091	1,982,431	1925.....	178,586	3,051,182	3,229,768
1915.....	262,198	2,037,266	2,299,464	1926.....	189,774	3,574,776	3,764,550

PRODUCTION OF CONCRETE BARS, SHOWING IRON AND STEEL CONCRETE BARS SEPARATELY, GROSS TONS, 1909-1926.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1909.....	.....	159,352	159,352	1918.....	468	344,152	344,620
1910.....	4,645	236,464	241,109	1919.....	2,295	416,726	419,021
1911.....	2,388	256,353	258,741	1920.....	698	571,747	572,445
1912.....	2,500	271,832	274,332	1921.....	1,094	226,134	227,228
1913.....	113	319,557	319,670	1922.....	696	575,120	575,816
1914.....	.....	288,471	288,471	1923.....	368	680,499	680,867
1915.....	.....	353,408	353,408	1924.....	507	655,615	656,122
1916.....	2,683	458,717	461,400	1925.....	1,195	818,392	819,587
1917.....	1,497	469,687	471,184	1926.....	1,649	814,180	815,829

PRODUCTION OF IRON AND STEEL BLACK PLATES FOR TINNING, 1903-1926.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1903.....	490,652	1911.....	795,598	1919.....	*1,144,601
1904.....	472,569	1912.....	982,197	1920.....	*1,449,330
1905.....	507,587	1913.....	827,266	1921.....	*786,962
1906.....	576,079	1914.....	938,181	1922.....	*1,266,652
1907.....	504,072	1915.....	1,093,345	1923.....	*1,498,830
1908.....	513,771	1916.....	*1,274,137	1924.....	*1,415,182
1909.....	606,482	1917.....	*1,505,338	1925.....	*1,632,236
1910.....	712,137	1918.....	*1,489,586	1926.....	*1,761,944

* Does not include black sheets rolled on sheet mills and used in the manufacture of long term plates.

3,330,572 tons. Light shapes advanced from 554,313 tons to 581,091 tons. Both new figures are the highest ever recorded.

Skelp produced a new high record at 3,764,550 tons, displacing the previous record of 3,734,336 tons, made in 1923. Merchant bars fell far short of the record made during the war, and of the heavy output of 1920. The production of 5,473,836 tons last year was more than 3 per cent below the 1925 output of 5,659,315 tons. In concrete bars, also, the 1926 tonnage was below 1925, although with that one exception it was the highest yet made. The output was 815,829 tons, compared with 819,587 tons in the preceding year.

Tin plate made a new high record at 3,750,481,879 lb., compared with 3,458,574,585 lb. in 1925, the previous high point. Terne plate at 241,883,727 lb. fell short of the record of 1925 at 254,885,172 lb. With the exception of 1925, however, the 1926 output was the largest ever recorded. Taking the two products to-

gether, the 1926 production was 1,996,183 net tons, a new high record, displacing the previous top mark of 1,856,730 tons made in 1925.

Galvanized sheets made a new high record at 1,471,523 net tons, displacing the previous high of 1,358,666 tons, made in 1925.

Seamless steel tubes at 775,329 gross tons surpassed by a large margin the previous record, which was 568,190 tons, made in 1925. The seamless tubes amounted to nearly 19 per cent of the total wrought pipe and tube output, which was 4,177,844 tons. Cast iron pipe and fittings made another high record at 2,003,506 net tons, an advance of 4 per cent over the previous top figure of 1,924,735 tons, made in 1925.

Of the total amount 676,854 tons, or 2 per cent, was of wrought iron. Merchant bars, 252,437 tons; skelp, 189,774 tons; and spike and chain rods, nut and bolt rods, horseshoe bars, shafting, tires, etc., 168,260 tons, made up nine-tenths of the iron total.

Age of Metal-Working Equipment

That 44 per cent of all metal-working equipment is at least 10 years old is the conclusion drawn from a series of studies recently completed by *American Machinist*, from which the accompanying table has been compiled. The investigation covered 16 major divisions of industry, involving 937,500 metal-working machines. This total is believed to represent more than 75 per cent of all such equipment in the United States. Of the total, no less than 413,865 machines had been in service for at least 10 years.

Not all types of machines had the same average life. Only 29 per cent of gear-cutting machines had been in use for 10 years. Riveting machines and broaching machines showed only 31 per cent in the old group. Others range from 38 per cent in the case of power presses to 56 per cent for forging machines, 57 per cent for hammers and 58 per cent for planers.

Distribution of Metal-Working Equipment and Proportion More Than 10 Years Old

Type of Machine	Total Number	Per Cent of Total	Over 10 Years Old	
			Number	Per Cent
Turning	216,051	23.1	103,187	48
Drilling	138,953	14.8	58,721	42
Grinding	105,589	11.3	42,710	40
Milling	72,675	7.7	30,244	42
Presses, power	45,249	4.9	17,243	38
Presses, hand and foot	28,529	3.1	12,219	43
Shapers and slotters..	23,998	2.6	12,273	51
Gear-cutting	22,328	2.4	6,263	29
Boring	21,624	2.3	9,487	44
Polishing, lapping and honing	20,684	2.2	9,129	44
Cutting-off	20,052	2.1	8,660	43
Threading	19,051	2.0	10,435	55
Planers	15,816	1.7	9,238	58
Shearing	12,436	1.3	5,906	47
Tapping	12,412	1.3	5,327	43
Hammers	12,341	1.3	6,997	57
Punching	10,665	1.1	5,374	50
Bending and straightening	8,701	0.9	4,584	53
Presses, hydraulic ..	8,570	0.9	4,207	49
Riveting	7,729	0.8	2,391	31
Forging	7,602	0.8	4,274	56
Keyseating	3,929	0.4	2,034	52
Centering	3,695	0.4	1,765	48
Broaching	3,650	0.4	1,124	31
All other	95,203	10.2	40,073	42
Total	937,532	100.0	413,865	44

Apparent consumption of Babbitt metal in the United States in May is reported by the Department of Commerce at 4,619,588 lb., compared with 4,169,277 lb. in the preceding month and with 4,797,038 lb. in May of last year. In the first five months of 1927 there has been a drop of 10 per cent from 26,179,426 lb. last year to 23,496,948 lb. this year. In 1925, consumption in the first five months was 26,700,174 lb.

Total production of farm equipment in the United States in 1926 was valued at \$461,399,528, against \$391,812,436 in 1925 and \$323,367,127 in 1924, according to data collected by the Department of Commerce at the annual canvass of manufacturers of farm equipment.

Iron Industry in 1926

Analysis of the iron industry of the United States in the last completed calendar year, compared with the preceding year, is covered in a report by the Bureau of Mines. The principal items are given in our table, showing comparison with the preceding year and the percentage of increase.

	1926	1925	Percent-age of Increase
Iron ore mined, gross tons	67,623,000	61,907,997	9
Iron ore shipped from mines.....	69,292,832	63,924,763	8
Value of ore shipped..	\$174,015,645	\$160,796,886	8
Value per ton..	\$2.51	\$2.52	
Pig iron shipped from furnaces....	38,181,053	36,814,702	3.7
Value of pig iron shipped	\$749,633,468	\$739,316,333	1.4
Value per ton..	\$19.63	\$20.08	
Ferroalloys shipped from furnaces....	689,258	616,222	11.9
Value of ferroalloys shipped	\$61,368,407	\$53,048,100	14.6
Value per ton..	\$89.04	\$86.08	

Works Councils Show Rapid Growth

The rapidity with which American industry is bridging the gap between employers and employees through works councils is disclosed in a report on "Employee Representation or Works Councils," issued by the department of manufacture of the Chamber of Commerce of the United States, Washington.

Although employee representation was virtually unknown before the World War, in 1926 there were 1,369,078 workers in the United States under employee representation, operating under more than 900 works councils in about 432 separate companies.

Coal in Europe

Study of the coal situation in Europe is made in Trade Information Bulletin No. 489 of the United States Bureau of Foreign and Domestic Commerce. It was prepared by John R. Bradley of the minerals section. It points out that France, the principal importer of coal, increased her production from 40,000,000 tons in 1913 to 52,500,000 tons in 1926, exclusive of the Saar production. World production of coal and lignite showed a gain of only 1 per cent from 1913, with 1,342,000,000 metric tons, to 1926, with 1,355,000,000 tons. Coal production, exports and imports of Great Britain, Germany, France, Poland, Italy and Belgium, with particular emphasis upon Great Britain, make up the bulk of the 39-page pamphlet.

Orders for steel boilers in May called for 1409 units aggregating 1,344,998 sq. ft. of heating surface. This is the smallest total since January. It compares with 1551 units and 1,500,503 sq. ft. in April. Watertube stationary boilers accounted for 640,604 sq. ft. in May. Heating (not power) boilers, at 412,662 sq. ft., followed, having much the largest number of any group, at 880.

Unusually Large Immigration Movement in April

WASHINGTON, June 24.—Including 50,344 aliens and 29,055 Americans, making a total of 79,399 persons, the incoming movement of immigration in April was the largest for any month since October, 1926, according to the Bureau of Immigration. In that month 56,587 aliens and 34,176 citizens entered the country, the total being 90,763. The principal races contributing immigrant aliens in April were Mexican, 7727; German, 5991; Irish, 4678; English, 3629; Scotch, 2400; Scandinavian, 2024; French, 1650; Hebrew, 1070. The other 32 races in the immigration statistical list furnished only 14.3 per cent of the total and none was over 700.

Of the aliens of all classes admitted during April, 17,116 came in under the quota; 14,741 as natives of non-quota countries, principally Mexico and Canada, and 7546 as home-coming residents of the United States. Three countries—Bulgaria, New Zealand and Belgium—exhausted their annual quotas during April. This makes six countries with quotas exhausted during the first 10 months of this fiscal year, the other three being Greece, Latvia and Luxemburg.

Iron and steel workers admitted in April numbered 250, while for the 10-month period the number was 2007. Departing iron and steel workers for these respective periods were six and 148. Metal workers admitted in April and during the 10-month period numbered 54 and 442, while those departing were 13 and 46. Machinists to the number of 230 were admitted in April, while for the 10-month period the number was 1776. Departing machinists for the two periods numbered 23 and 399, respectively.

British Steel Exports for May Highest Since 1923—Imports Dwindling

WASHINGTON, June 24.—Recovery of the British iron and steel industry from the coal strike is strikingly shown by its foreign trade figures for May, the exports, totaling 422,426 gross tons, being the highest for any month since 1923, while the imports, 355,938 tons, for the first time since May, 1926, were less than the exports.

A dispatch received by the Iron and Steel Division, Department of Commerce, from Commercial Attaché William L. Cooper, London, stated that the May exports represented approximately the maximum tonnage available after the needs of the domestic market had been satisfied. It is estimated that, of the total exports in May, nearly 90 per cent was steel, while of the imports a little more than 70 per cent was steel.

Over the five months of 1927 British iron and steel exports have averaged 316,205 gross tons per month as compared with 249,472 tons and 310,919 tons, the respective monthly averages for 1926 and 1925. Imports over the five months averaged 447,527 tons monthly as against 311,690 tons in 1926 and 225,084 tons in 1925.

Iron and Steel Production of Canada

Production of pig iron in Canada in May is reported by the Dominion Bureau of Statistics at 78,987 gross tons an increase of 2 per cent over the 77,240 tons of April and of 9 per cent over the 72,762 tons of May, 1926. For the first five months, the pig iron production was 334,276 tons, an increase of 11 per cent over the 300,010 tons of last year. This year's output included 249,526 tons of basic iron, 64,592 tons of foundry iron and 20,158 tons of malleable iron.

No furnaces were blown in or banked during May, the six furnaces in operation at the beginning of the month continuing throughout the period. They include two at Sydney, N. S.; two at Hamilton, Ont., and two at Sault Sainte Marie, Ont. The charges included 142,936 gross tons of imported iron ore, an average of 1.81 tons per ton of pig iron produced. Coke to the extent of 87,215 net tons represented 2208 lb. per ton of pig iron. Limestone was charged to the extent of 43,303 net tons, or 1097 lb. per ton of iron.

Ferroalloys produced in May aggregated 2788 gross

tons in May, and 2047 tons in April. The total for the five months has been 20,555 tons, against 13,913 last year.

Steel ingots aggregating 92,227 tons were produced in May, against 104,540 tons in April, a reduction of 12 per cent. Steel castings dropped from 4567 to 4484 tons. The production of steel was 8 per cent higher than the 89,513 tons of ingots and castings in May, 1926. During the first five months, steel production has been 427,370 tons, an increase of 22 per cent over the 1926 output of 349,907 tons in five months. This year's figures include 406,950 tons of ingots and 20,420 tons of castings.

Ferroalloys Produced in 1926

Figures of the United States Bureau of Mines show shipments of 689,258 gross tons of ferroalloys from furnaces in 1926, an increase of 11.9 per cent over the 1925 production of 616,222 gross tons. The total value in 1926 is given as \$61,368,407, or an average of \$89.04 a ton. This compares with \$53,048,100 in 1925, representing an average of \$86.08 a ton. The total value increased 14.6 per cent. Details are given in the table.

Alloy	1925		1926	
	Gross Tons	Value	Gross Tons	Value
Ferromanganese ..	254,005	\$26,006,439	330,070	\$31,711,871
Silico - manganese and silico-spiegeleisen			2,183	354,364
Spiegeleisen	95,890	2,407,226	82,982	2,016,088
Ferrosilicon (7 per cent or more silicon)	221,387	11,405,060	233,428	12,119,465
Ferromolybdenum and calcium-molybdenum compounds	210	236,957	1,096	1,051,881
Ferrotungsten	1,238	1,991,123	1,771	2,900,053
Ferrovanadium ...	1,841	4,843,635	1,777	4,721,903
Other varieties (a)	41,651	6,157,660	35,951	6,492,782
	616,222	\$53,048,100	689,258	\$61,368,407

(a) 1925: Ferrochromium, ferrophosphorus, ferrotitanium, ferroumium, ferrozirconium, and zirconium-ferrosilicon; 1926: Ferrochromium, ferrophosphorus, ferrotitanium, ferrozirconium, and zirconium-ferrosilicon.

Fewer Steel Barrels Made

Production of steel barrels in May, reported by 28 companies to the Department of Commerce, amounted to 588,077 units. While this was a drop of 2 per cent from the April production of 599,771 barrels, it was with that one exception the largest month's output since June, 1926, with 626,812. In May, 1926, the total was 581,962. Shipments were about 2 per cent below production, resulting in a gain in stocks from 50,070 to 62,435, the largest figure in considerably more than a year.

Shipments of the members of the Steel Barrel Manufacturers' Association amounted to 359,399 barrels, of which more than one-third went to New Jersey, with Pennsylvania and New York as usual in second and third places. The volume of business in May is reported as \$1,130,548. Capacity was engaged to the extent of 49.8 per cent, including 24.7 per cent of the capacity for I. C. C. barrels and 56.9 per cent for light barrels.

Unfilled orders at the end of the month, as reported to the Department of Commerce, aggregated 1,197,894 units, of which 250,029 called for delivery within 30 days. Unfilled orders of the association are given as 717,045. In the larger group the total of unfilled orders is the smallest since Oct. 31, having shown a drop of more than 150,000 during the month.

Canadian Automobile Production

May production of automobiles in Canada, as reported to the Department of Commerce by the Dominion Bureau of Statistics, included 21,991 passenger cars and 3717 trucks. This compares with production in April of 20,890 passenger cars and 3721 trucks, and production in May, 1926, of 21,429 passenger cars and 3505 trucks.

Passenger cars, in the first five months, are ahead of last year, at 88,541 compared with 83,889. Trucks, at 18,432 in five months of 1927, are behind last year's 19,238.

Commercial Steel Castings Bookings in May Lowest in Months

WASHINGTON, June 25.—Aggregating 66,425 net tons, or 50 per cent of capacity, bookings of commercial steel castings in May, according to reports received by the Department of Commerce from 123 concerns with a monthly capacity of 133,000 tons, compared with 78,282 tons or 59 per cent of capacity in April. The May total was the lowest in many months. Of the May bookings 24,848 tons were for railroad specialties, representing 41 per cent of that class of capacity, as against 31,004 or 52 per cent in April. Bookings of miscellaneous castings in May amounted to 41,577 tons or 57 per cent of capacity, as against 47,278 tons or 65 per cent of capacity in April.

Production in May totaled 81,671 tons, or 61 per cent of capacity, compared with 90,498 tons or 68 per cent of capacity in April. Of the May output, 32,043 tons or 53 per cent of capacity, were for railroad specialties, against 36,693 tons or 61 per cent in April. Miscellaneous bookings in May totaled 49,628 tons or 68 per cent of that class of capacity, against 53,805 tons or 74 per cent in April.

Bookings in five months are 13 per cent behind 1926, standing at 420,610 tons, against 482,493 tons last year. Both classes lost in bookings, the miscellaneous group more heavily than railroad specialties. Production in five months, at 439,424 tons, is likewise 13 per cent below the 1926 total, 503,144 tons. In this case the railroad specialties lost much more heavily than did the miscellaneous group.

Decline in Wholesale Prices Apparently Checked

While there has been for some time a steady decline in wholesale prices of commodities, as reported month by month by the United States Bureau of Labor Statistics, the drop in May compared with April was so slight that the declining movement appears to approach its end. The May figure, based on 404 commodities, was 144.1, compared with 144.2 in April. Both figures are

the lowest in five years, or since April, 1922, when 143 was recorded. Except for the period from June, 1921, to April, 1922, the price level is the lowest since the United States entered the war.

Metals and metal products are the lowest of the eight main groups, standing at 120.6 in May, against 121.9 in April. With few exceptions, each month has shown the metals lower than any of the other groups. The drop in metals from a year ago (125.2) has been nearly 4 per cent. At the same time, the drop in all commodities from a year ago (151.7) has been nearly 5 per cent. All figures are based on 100 as the average of 1913.

More Steel Moved by River in Pittsburgh District

The movement of iron and steel products by water increased again in May, according to the monthly report of river commerce by the United States Engineer's office, Pittsburgh. The report, which covers the movement of freight on the Monongahela, Allegheny and Ohio rivers from the Pittsburgh district to Wellsburg, W. Va., on the Ohio River, shows a total movement for May of 92,384 net tons of iron and steel products. That compares with 84,711 tons in April and 29,016 tons in March. Total commerce fell slightly last month from that of the previous month, coke and iron and steel products being the only items to register gains. The figures with comparisons follow:

Pittsburgh District River Traffic in Net Tons

Commodity	Allegheny River	Monongahela River	Ohio River	Total
Coal	31,335	1,453,634	306,495	1,791,464
Coke	16,100	108,623	55,700	180,423
Gravel	68,995	100,400	125,388	294,783
Packet cargo .....	.....	.....	5,193	5,193
Sand	76,150	86,050	146,899	309,099
Iron and steel	300	41,954	50,130	92,384
Unclassified	2,912	15,420	6,917	25,249
Total for May ..	195,792	1,806,081	696,722	2,698,595
Total for April ..	184,015	1,829,631	744,400	2,758,046
Total for March ..	108,433	2,529,828	765,632	3,403,893
Total for Feb. ..	85,605	2,117,558	624,697	2,827,860
Total for Jan. ..	89,242	1,935,879	621,496	2,646,617

Steel Entente Produces 33 Per Cent of World Output

EIGHT countries comprising the European steel entente—Germany, France, Belgium, Luxemburg, the Saar, Czechoslovakia, Austria and Hungary—represent approximately one-quarter of the steel-making capacity of the world, according to a brochure on the "Origin and Development of the Continental Steel Entente" by J. Joseph W. Palmer, iron and steel division, Bureau of Foreign and Domestic Commerce, Washington. In 1926, however, the combined steel output of those countries amounted to 33 per cent of the estimated total world production. In the same year the United States accounted for about 55 per cent of the world output.

The consumption of steel in Germany probably amounts annually to 80 or 85 per cent of its production, according to the report, while that of France will not normally exceed 60 per cent, that of Belgium 35 per cent, and that of Luxemburg and the Saar no more than 20 per cent each.

In the period since the war all of the major steel-producing na-

tions of Europe increased their production in considerable amount. With consumption in home markets virtually at a pre-war level and that of much of the rest of the world in a similar state (except the United States), the steel making countries of the Continent found themselves engaged in a

price war in which profits had to be sacrificed in an effort to keep up plant activity, and in which each was underselling the other, both in home markets and in those other markets where steel either was not produced at all or where production was insufficient to meet local demands.

HOW LEADING COUNTRIES STAND IN STEEL
(In Thousands of Metric Tons)

Country	Productive Capacity		Actual Production		Foreign Trade, 1925 ¹		Estimated Normal Internal Consumption
	Present	1913	1925	1926	Imports	Exports	
Germany	17,500	18,934	12,294	12,342	1,449	3,549	10,250
France	10,000	4,687	7,417	8,382	207	4,007	5,000
Belgium	3,500	2,466	2,403	3,201	* 603	* 3,312	{ 1,000 400
Luxemburg	2,500	1,326	2,084	2,244			
Saar	2,000	1,733	1,575	1,734	(*)	(*)	350
Czechoslovakia ...	1,500	(*)	1,361	1,219	228	516	1,075
Austria	650	420	464	474	139	272	330
Hungary	500	443	231	240	12	(*)	250
United Kingdom...	12,000	7,786	7,516	3,553	2,721	3,731	6,500
Italy	2,000	846	1,785	1,712	* 1,993	* 15	3,500
Poland	1,500	(*)	782	625	231	100	815
Sweden	650	591	521	482	200	227	450
United States	59,000	31,802	46,120	49,008	957	1,762	50,000
Canada	1,800	1,060	765	789	(*)	(*)	2,000

¹ Includes pig iron.

² Pre-war area.

³ Includes exports from Luxemburg.

⁴ Figures not available.

⁵ Estimated on basis of first six months.

⁶ Not available in tonnage.

May Exports and Imports Higher

But Imports in 5-Month and 11-Month Periods
Dropped Sharply, While Exports
Increased

WASHINGTON, June 24.—Both exports and imports of iron and steel in May showed increases when compared with April. Exports made a gain of 10,369 gross tons, or 5½ per cent, totaling 202,708 tons, the highest since January of the present year, when the total was 215,235 tons. For the 11 months ended with May, exports aggregated 2,093,804 tons, an increase of 304,450 tons, or 17 per cent, over the corresponding period of last year, with a total of 1,789,354 tons. For the five-month period of January-May, 1927, exports totaled 947,504 tons, against 869,099 tons for the corresponding period of last year, an increase of 78,405 tons, or 9 per cent. Except for January, 1927, and November, 1926, exports in May were the highest since January, 1924.

Imports in May made a much sharper gain than exports, the increase being 19,440 tons, or 32 per cent, and the total 79,814 tons. A reverse situation applies to imports for the 11 months ended with May, 1927, when they totaled 809,000 tons, a decrease of 147,566 tons, or 15½ per cent, under the imports of 956,566 tons for the corresponding period one year ago. Imports for the 1927 five-month period reflected a marked decline, amounting to 173,844 tons, or 36 per cent, the total incoming shipments for the respective periods of

the present and last year being 314,915 tons and 488,759 tons.

Gains in exports in May and during the five and 11-month periods ended May, when compared with corresponding periods of one year ago, were reflected in a number of items, chiefly in heavy finished lines, while the declines, where made in imports, were due chiefly to falling shipments of pig iron. The increase in May over April was due to the largest extent to incoming shipments of that blast furnace product, which nearly doubled. Increases were made also in hoop steel, structural shapes and steel tubular products, while cast iron pipe imports showed a drop.

Particular Products

The largest export movement of any single finished product in May was made by tin plate, with a total of 18,597 tons, of which Japan took 4719 tons; Canada, 3301 tons; China, 2660 tons; Argentina, 1935 tons, and Mexico, 1255 tons. Black steel sheets came second in the finished line in the May export movement, with a total of 17,722 tons, an increase of 5998 tons over April. Of the May shipments, Canada took 7506 tons and Japan, 7472 tons. Of the 12,538 tons of galvanized sheets exported in May, 4071 tons went to Canada,

Exports of Iron and Steel from the United States

	(In Gross Tons)		Eleven Months Ended May	
	1927	1926	1927	1926
Pig iron	4,115	1,107	33,768	29,218
Ferromanganese	101	1	631	1,587
Scrap	26,728	12,654	120,399	89,382
<i>Pig iron, ferroalloys and scrap</i>	<i>30,944</i>	<i>13,762</i>	<i>154,798</i>	<i>120,187</i>
Ingot, blooms, billets, sheet bar, skelp....	7,165	7,981	99,020	80,689
Wire rods	1,065	1,899	16,891	16,868
<i>Semi-finished steel ...</i>	<i>8,230</i>	<i>9,880</i>	<i>115,911</i>	<i>97,557</i>
Steel bars	8,989	10,529	119,406	115,610
Alloy steel bars	457	273	4,668	3,625
Iron bars	297	519	5,052	3,633
Plates, iron and steel.	15,925	11,155	130,232	104,804
Sheets, galvanized ...	12,538	13,196	162,144	147,484
Sheets, black steel ...	17,722	17,415	166,989	137,535
Sheets, black iron ...	1,228	1,461	15,604	17,972
Hoops, bands, strip steel	3,592	3,929	41,917	43,421
Tin plate,terne plate	18,597	13,408	286,659	169,516
Structural shapes, plain material	15,845	15,618	135,573	121,046
Structural material, fabricated	5,109	5,891	59,802	79,641
Steel rails	16,554	11,405	203,253	132,789
Rail fastenings, switches, frogs, etc.	4,752	2,742	36,484	36,175
Boiler tubes, welded pipe and fittings...	20,751	20,063	284,910	247,691
Plain wire	2,972	3,394	25,033	33,583
Barbed wire and woven wire fencing	5,085	4,925	38,145	60,154
Wire cloth and screening	234	189	1,935	1,811
Wire rope	415	1,256	4,158	5,594
Wire nails	619	1,145	8,546	11,065
Other nails and tacks.	591	719	6,270	8,266
Horseshoes	53	15	535	612
Bolts, nuts, rivets and washers, except track	1,007	1,121	10,933	14,502
<i>Rolled and finished steel</i>	<i>153,332</i>	<i>140,368</i>	<i>1,748,218</i>	<i>1,496,529</i>
Cast iron pipe and fittings	2,427	5,854	25,917	31,659
Car wheels and axles.	4,444	1,706	16,770	14,860
Iron castings	740	814	9,591	9,240
Steel castings	660	856	6,183	5,802
Forgings	634	178	3,526	2,203
<i>Castings and forgings</i>	<i>8,905</i>	<i>9,408</i>	<i>61,987</i>	<i>63,764</i>
All other	1,297	850	12,860	11,317
Total	202,708	174,268	2,093,804	1,789,354

Imports of Iron and Steel Into the United States

	(In Gross Tons)		Eleven Months Ended May	
	1927	1926	1927	1926
Pig iron	17,164	57,211	174,764	485,199
Ferromanganese*	2,043	2,027	31,485	53,018
Ferrosilicon†	1,080	975	13,228	5,811
Ferrochrome‡	12	...	575	...
Scrap	6,750	1,939	82,729	72,464
<i>Pig iron, ferroalloys and scrap</i>	<i>27,049</i>	<i>62,152</i>	<i>302,781</i>	<i>616,492</i>
Steel ingots, blooms, billets and slabs...	857	5,377	17,286	23,226
Iron blooms, slabs, etc.	...	...	306	779
Wire rods	1,388	701	11,187	7,728
<i>Semi-finished steel ...</i>	<i>2,245</i>	<i>6,078</i>	<i>28,779</i>	<i>31,733</i>
Rolls and splice bars.	1,139	1,803	33,159	31,883
Structural shapes ...	14,241	9,291	136,051	68,729
Boiler and other plates	79	881	4,124	2,629
Sheets and saw plates	1,507	593	13,482	4,131
Steel bars	9,788	12,386	90,656	71,133
Bar iron	153	237	4,600	6,375
Hoops, bands and cotton ties	3,375	3,973	29,782	14,159
Tubular products (wrought)	9,743	1,847	44,409	30,190
Nails, tacks, staples..	683	380	5,909	3,525
Tin plate	750	15	1,068	1,651
Bolts, nuts, rivets and washers	11	19	218	279
Round iron and steel wire	646	182	4,276	3,757
Barbed wire	352	166	3,470	5,883
Flat wire; strip steel.	268	131	3,139	2,210
Steel telegraph and telephone wire ...	2	...	1,073	215
Wire rope and strand	179	259	2,410	1,552
Other wire	26	331	666	1,421
Wire cloth and screening .....	...	49	281	382
<i>Rolled and finished steel</i>	<i>42,942</i>	<i>32,543</i>	<i>378,773</i>	<i>250,104</i>
Cast iron pipe	7,257	7,775	95,736	55,943
Castings and forgings	321	183	2,931	2,294
Total	79,814	108,731	809,000	956,566
Manganese ore*	18,223	21,633	296,752	357,092
Iron ore	186,208	238,678	2,425,118	2,107,811
Magnesianite (dead burned)	2,736	8,598	46,116	61,537

*Manganese content only. Shipments of ore from Cuba, which are stated in gross weight, represented 138 tons in May, 1927.

†Silicon content
‡Chromium content.

1016 tons to Cuba, 772 tons to Colombia, 766 tons to the Philippine Islands and 668 tons to Mexico.

Steel rail exports in May amounted to 16,554 tons, of which 5950 tons went to Japan, 2070 tons to Canada and 1607 tons to Cuba. Canada took 13,817 tons of the 15,845 tons of plain structural material exported in May and 6116 tons of the 8989 tons of steel bars shipped abroad that month. The United Kingdom took 670 tons. Exports of iron ore in May were unusually large, amounting to 143,267 tons. All except 3 tons went to Canada.

Of the 2043 tons of ferromanganese imported in May, 1233 tons came from Canada, 553 tons from

Norway and 240 tons from the United Kingdom. British West Africa, supplying 6977 tons, was the largest source of imports of manganese ore concentrates in May, the total being 18,223 tons. British India furnished 4815 tons; Soviet Russia, 3227 tons, and Brazil, 3253 tons. Of the 9788 tons of steel bars imported in May, 5945 tons came from Belgium, 1738 tons from Germany, 973 tons from Sweden and 775 tons from France. Belgium provided 10,049 tons of the 14,241 tons of structural shapes imported in May. Germany furnished 2272 tons and France, 1476 tons. France was the source of 5613 tons and Belgium of 1644 tons of the 7257 tons of cast iron pipe imported in May.

Steel Furniture Orders and Shipments Show Decline

WASHINGTON, June 27.—Shipments of steel furniture stock goods in the business group in May were valued at \$2,428,672, according to reports received by the Department of Commerce from 33 manufacturers. This compares with \$2,849,536 in April and with \$2,575,561 in May, 1926. The May total was the lowest for any month since last August. Shipments of steel shelving furniture in May, as reported by 15 companies, were valued at \$585,397, against \$677,745 in April.

New orders in the business group were valued at \$2,381,369, compared with \$2,750,877 in April, while unfilled orders at the end of the two months were valued at \$1,597,944 and \$1,645,599, respectively. The total value of new orders for the five months ended with May was \$13,812,453, against \$13,814,537 for the corresponding period of last year, while the respective values of shipments were \$13,776,272 and \$13,659,703.

New orders received in the shelving group in May, 1927, were valued at \$686,144, against \$621,888 in April. Unfilled orders at the end of the two months were valued at \$731,157 and \$627,266, respectively. For the five months ended with May the value of new orders in the shelving group was \$3,232,206, against \$3,095,538 for the corresponding period of 1926. Shipments for the five-month periods were valued at \$3,117,543 and \$3,224,705, respectively.

Sales of Foundry Equipment Gain

May sales of members of the Foundry Equipment Manufacturers' Association, at \$493,801, showed a gain of 3 per cent compared with the total for April. The increase followed declines reported in the two preceding months. The May total was also 1 per cent larger than that for the same month in 1926. Sales in the first five months of 1926 showed a gain of 6 per cent over the corresponding period last year. Shipments in May, at \$503,747, showed a loss of 16 per cent compared with those in April, but a gain of 10 per cent over the total for May, 1926. Orders on hand June 1, at \$705,909, were 16 per cent smaller than on May 1.

Survey of Industrial Migration Under Way

The tendency of industry to migrate is being studied in a survey undertaken by the organization service of the Chamber of Commerce of the United States, Washington, in cooperation with organization members throughout the country. If sufficient data are gathered through the year, a chart will be prepared showing by lines of industry the number of plants which began operations in 1927 and their relative sizes as indicated by the number of employees; the location of manufacturing companies establishing branch plants and where the branch plants are situated, the drift of industries from one city to another.

Production of bituminous coal is holding at about 8,500,000 tons a week, in spite of the strike. This is not far from estimated industrial requirements, and the heavy stocks are not dwindling rapidly. In the week ended June 11 the output is reported by the United States Bureau of Mines at 8,522,000 net tons. This compares with 9,624,000 tons in the corresponding week of 1926, when there was no strike.

May Employment in Ohio Metal-Working Shops Shows Gain Over 1926

May employment in Ohio foundries and machine shops declined 5 per cent from April, according to the monthly bulletin of the Bureau of Business Research of Ohio State University. The May index of 95.7 shows, however, an increase of 4.8 per cent from that of May, 1926. The May reports from 13 Ohio steel works and rolling mills reveal little change in the employment situation, although the curve turned slightly upward from April. Here also an improvement over May, 1926, is noted, the betterment amounting to 7.2 per cent. In May construction employment in Ohio climbed 7.4 per cent as compared with April, according to reports from 90 general contractors. The May level, however, is 15.1 per cent under that in the same month last year.

Business in Electric Hoists

Domestic distribution of electric hoists in 1926 was practically the same as in 1925, according to a report at the annual meeting of the Electric Hoist Manufacturers' Association, E. Donald Tolles, secretary, 165 Broadway, New York. There was a definite gain in exports, however. During the year a change was made in reporting statistics, so that standard sizes are segregated, thus giving a better line on the trend in differing capacities. A report was presented, showing the number of hoists supplied to the principal lines of industries during each of the past five years.

Brief Business Items

Sales of standard brass pipe by American manufacturers have increased from 16,016,500 lb. in 1922 to 53,446,800 lb. in 1926, according to the Copper and Brass Research Association, New York, which has published a chart showing the average yearly gain in three years.

Production of coke in May is reported by the United States Bureau of Mines at 4,422,000 net tons, a slight drop from April and a considerable drop from March. The total is more than 5 per cent below the average month of 1926, but is somewhat above that of 1925. By-product coke in May accounted for 3,792,000 tons and beehive coke for 630,000 tons.

Reports of the American Telephone & Telegraph Co. show an increase in long distance calls of over 11 per cent, as compared with the same period of a year ago. Toll and long distance conversations now average 2,374,000 daily as compared with 149,000 in 1900.

Shipments of enameled sanitary ware in May are reported by the Department of Commerce at 374,519 pieces, compared with 373,288 pieces in April and with 424,156 pieces in May, 1926. Bath tubs show a decline in the first five months, from 496,060 last year to 469,681 this year. Every month has been below the corresponding month a year ago.

The Steel Club of Philadelphia, an organization of sales executives, held its annual outing and golf party at the Aronomick Country Club, near Philadelphia, on Friday, June 17. About 140 were entered in the golf contest and 170 sat down at the dianer which followed. Many steel buyers were guests of the club.

Machinery Markets and News of the Works

JUNE BUSINESS OFF

Decline from May Volume Reported by Some Machinery Builders

First Half of the Year About 70 to 80 Per Cent
of Same Period Last Year, According
to Some Estimates

MACHINE tool business in June has fallen below that of last month, according to estimates of some of the leading tool builders, and the first half of the year produced total sales of about 70 to 80 per cent of those received in the corresponding period last year. Unemployment in some metalworking industries is having a tendency to restrict the demand for tools.

New York

NEW YORK, June 28.

COMPARISONS made by local machine tool sales offices with last month's records generally show a slight falling off in June business. Inquiries, also, are fewer in number. An Eastern tool builder has received an order from an electrical manufacturing plant in Indiana for two 1 x 18-in. automatic lathes, one 16 x 60-in. engine lathe and a 6-in. vertical shaper. Other orders of the week include the following: A railroad car builder in Indiana, 48-in. carwheel borer; Atchison, Topeka & Santa Fe Railroad, an axle lathe; New York Central Railroad, a 90-in. locomotive axle journal turning lathe; Northern Pacific Railroad, 42-in. x 24-ft. heavy lathe; Milwaukee technical high school, 13 x 30-in. lathe; a Michigan tool manufacturer, a jig borer; War Department, a universal bench hand milling machine; boiler plant in New Jersey, a 7 x 32-in. bench lathe; an electrical manufacturer in Massachusetts, a 13 x 30-in. lathe.

Contract has been let by the Meurer Steel Barrel Co., 23 West Forty-third Street, New York, to Merolan Brothers, Long Island City, for a one-story addition to its plant, 50 x 180 ft., at Long Island City, including alterations and improvements in existing factory, to cost approximately \$75,000. L. Allmendinger, 852 Monroe Street, Brooklyn, is architect.

The Lamb & Jensen Dredging Co., Sunrise Boulevard and Grove Street, Freeport, L. I., has inquiries out for a belt-driven hoist, 5-drum type.

The Joseph Wiggins Coal Co., Inc., New York, has leased property at Fifth Avenue, 141st Street and the Harlem River, for a new storage and distributing plant. Coal pockets will be built, loading machinery and other equipment installed.

Fire, June 18, destroyed a portion of the mill of the Fort Miller Pulp & Paper Co., Fort Miller, N. Y., with loss reported at close to \$100,000 with equipment.

Ovens, power equipment, conveying and other machinery will be installed in the seven-story addition to be erected to the plant of the Bennett Biscuit Co., 137 Avenue D, New York, to cost in excess of \$600,000 with equipment. The McCormick Co., 41 Park Row, is architect and engineer.

The Magnetic Auto Parts, Inc., 1 West 142nd Street, New York, has acquired vacant property, 100 x 210 ft., at Fifth Avenue and 143rd Street, and is reported planning a new one-story works to occupy the entire plot.

Fire, June 17, damaged a portion of the machinery, fix-

The Ford Motor Co., Detroit, has purchased a number of special machines in arranging for the production of a new model, scheduled for appearance in September. Other automobile builders are buying very lightly.

A few railroad orders have been placed, among the buyers being the Missouri Pacific, New York Central, Rock Island, Santa Fe and Northern Pacific. The Cincinnati Street Railway Co., Cincinnati, will buy seven engine lathes, one or two carwheel lathes, two boring mills, a turret lathe and other tools, its probable purchases being estimated at \$100,000.

There is a fairly good demand for presses, one Cleveland manufacturer having sold 12 within the past week to eight companies. The Rockcastle Engineering Co., Chicago, has bought several tools. John Deere & Co., Waterloo, Iowa, still have several items to buy on a list sent out recently.

tures and stock at the works of the City Auto Radiator Co., 520-24 West Forty-eighth Street, New York.

T. H. Williams, Deveroux Building, Utica, N. Y., architect, has preliminary plans for a four-story automobile service, repair and garage building, to cost upward of \$100,000 with equipment.

The Tide Water Oil Co., 11 Broadway, New York, is said to be planning the construction of a new oil storage and distributing plant at Albany, N. Y., to cost more than \$350,000 with equipment.

The Union Carbide & Carbon Corporation, 30 East Forty-second Street, New York, is said to have plans maturing for a new plant at Duluth, Minn., to cost close to \$200,000 with equipment.

The Port Chester Iron Works, Inc., Traverse Street, Port Chester, N. Y., has awarded a general contract to Michele Di Leo, 55 Soundview Avenue, for a new one-story plant, 50 x 76 ft., to cost about \$23,000 with equipment. R. Vickers, Bar Building, White Plains, N. Y., is architect.

Fire, June 18, damaged a portion of the plant of the United Steel Frame Co., Inc., 18 Greene Street, New York, manufacturer of steel frames for suitcases, etc.

The Ruberoid Co., 95 Madison Avenue, New York, manufacturer of roofing products, is considering enlargements in its plant at Bound Brook, N. J., including installation of additional equipment. The company is arranging for a stock issue to total \$1,757,100, a portion of the fund to be used for expansion.

The Fada Radio Corporation, 1581 Jerome Avenue, New York, manufacturer of radio equipment, has leased four floors in the industrial building at Jackson Avenue and the Bridge Plaza, Long Island City, totaling about 110,000 sq. ft. of floor-space, all of which will be given over to manufacture. The company purposes to remove its present plant to the new location and will provide additional equipment. The Fada organization purchased a site on 138th Street, between Moft and Walton Avenues, some months ago, with intention of erecting a four-story plant. It is understood that this project will now be held in abeyance.

A power house for central station steam service will be constructed at the new Sarah Lawrence College, Bronxville, N. Y. The entire project will cost in excess of \$750,000. Bates & Howe, 145 East Fifty-seventh Street, New York, are architects.

The Bellanca Aircraft Corporation of America, Inc., care of Andrew Bellanca, 165 Broadway, New York, a nephew of Giuseppe M. Bellanca, head of the company, recently formed with a capital of \$1,000,000, is negotiating for a lease of the plant of the Aeromarine Plane & Motor Co., Keyport, N. J., for the manufacture of monoplanes and other types of airplanes and parts. The company is said to have a contract for the construction of five 12-passenger, three-

motor monoplanes for a proposed New York-Chicago air service.

Augustus Mowell & Co., 242 Main Street, Paterson, N. J., steam fittings and kindred equipment, have awarded a general contract to the P. S. Van Kirk Co., 85 Fulton Street, for a new one-story pipe and fitting shop, 75 x 100 ft., to cost close to \$20,000 with equipment.

The Tung-Sol Lamp Works, Inc., 95 Eighth Avenue, Newark, N. J., has purchased property at High Street and Seventh Avenue, and is said to be planning an addition, with equipment for considerable increase in output.

The Board of Education, City Hall, Newark, has preliminary plans for a new two or three-story building for the Fawcett school of industrial arts, to cost more than \$250,000. Guilbert & Betelle, Chamber of Commerce Building, are architects.

The Driver-Harris Co., Harrison, N. J., manufacturer of nickel-chrome alloy wire and castings, is disposing of a bond issue of \$1,300,000, a portion of the proceeds to be used for financing and proposed expansion. Frank L. Driver, Jr., is president.

The Board of Denville Township Commissioners, Denville, N. J., is said to be planning the installation of pumping equipment in connection with a proposed water supply system. A fund of about \$225,000 will be arranged for the entire project.

The Adalink Chemical Co., recently organized to manufacture a rust removing compound, has begun manufacturing operations in its plant on Grafton Street and Riverside Avenue, Newark. O. E. Link is president.

The Supreme Oil Burner Co., 823 Broadway, Bayonne, N. J., has been organized to manufacture automatic oil burners of the forced draft type for domestic heating, under patents applied for by George Peterson. The company has a plant at the above address where manufacturing is in progress.

The Congress Oil Co., 396 Broadway, New York, has been organized to manufacture lubricants and is temporarily occupying a plant on Central Avenue, Rahway, N. J., where compounding and blending equipment is being installed.

The General Wire Mesh Co., Inc., 677 Lexington Avenue, Brooklyn, has been organized to manufacture and install wire mesh guards, partitions, railings and inclosures for banks, factories, offices, etc. The company has manufacturing facilities at the above address. Machinery and equipment have been purchased.

New England

BOSTON, June 27.

MACHINE tool business in this territory the past week was the smallest for any similar period this month. Sales of new equipment are again at a minimum, and orders for used tools fell off perceptibly. Used tools reported as sold aggregated approximately 14, most of which were small lathes. No new inquiries of importance are noted and dealers are occupied chiefly with those sent out a week or more ago. It is estimated that June will be a fairly good month with used equipment dealers, but a poor one with new tool houses.

Small tools are not selling as well as last month. Business of the Greenfield Tap & Die Corporation, Greenfield, Mass., the first five months of this year was practically the same as that for the corresponding period last year. The Pratt & Whitney Co., Hartford, is reported as having had an excellent year in small tools.

As is usual at this time of the year, unemployment is increasing in New England. There is said to be a surplus of machine shop help in all leading industrial centers.

The Reed-Prentice Co., Worcester, Mass., organized in 1926 to take over the business of the Reed-Prentice Co. as of May 22, has been making progress in earnings, which for some time are reported to have been at the rate of \$60,000 a year. Since Jan. 1 the company has reduced its current notes payable by \$20,000. Its new product has been in demand and at the present time it has a good volume of orders on hand.

The machine shop equipment of P. H. Monty, Inc., 535 Albany Street, Boston, was sold at public auction recently. About two dozen tools were included. Good prices were obtained.

The Boston & Maine Railroad, North Station, Boston, will construct a one-story 29 x 127 ft. mill unit and one-story, 20 x 40 ft. tin shop at East Cambridge, Mass.

Plans are nearing completion for a trade school at Southbridge, Mass., to cost, with equipment, approximately \$180,000. W. G. Lamoureux is chairman of the selectmen, and H. M. LeClair, chairman of the building commission. M. A. Dyer, 1 Beacon Street, Boston, is the architect.

The real estate and property of the Westinghouse Air Spring Co., 25 Fox Street, New Haven, Conn., will be sold at public auction today, June 27.

The C. D. Proctor Co., 30 Church Street, New York, with representative at Cliftondale, Mass., is extending its production tool service by the acquisition of the line of taps and dies made by the Threadwell Tool Co., Greenfield, Mass.

The Arrow Electric Co., Hartford, Conn., manufacturer of electrical equipment, has plans for a new one-story factory, 106 x 114 ft., with foundations to provide for four additional floors later; a one-story addition, 37 x 300 ft., will also be built at the present plant on Hawthorn Street. Mylchreest & Reynold, 238 Palm Street, are architects and engineers.

The Wellesley Colonial Garage, Inc., Wellesley, Mass., will soon begin the erection of a two-story service, repair and garage building, 105 x 140 ft., to cost more than \$85,000 with equipment. Blackall, Clapp & Whittemore, 31 West Street, Boston, are architects.

The Heli Co., Twenty-sixth Avenue, Milwaukee, manufacturer of motor truck body hoists, iron and steel tanks, etc., has plans for a new one-story factory branch, service and distributing plant at Brighton, Boston, to cost about \$45,000. Local offices are at 298 North Harvard Street. Krug & Smith, Milwaukee, are architects.

The Board of Trustees, Rhode Island State College, Kingston, is arranging for the early erection of a new engineering and mechanical building at the institution, to cost upward of \$200,000 with equipment. Bigelow, Kent, Willard & Co., 31 St. James Avenue, Boston, are architects and engineers.

The Eastern Massachusetts Electric Co., 129 Railroad Street, Boston, is planning extensions and improvements at Salem, Mass., and vicinity, including the construction of a transmission line from the last noted place to Haverhill and Newburyport, about 75 miles distant.

The Worcester Consolidated Street Railway Co., Worcester, Mass., has plans for a new bus service and repair shop, with garage, to cost close to \$65,000 with equipment.

The City Council, Warwick, R. I., is said to be planning the installation of pumping equipment in connection with a proposed municipal waterworks. The entire project will cost in excess of \$1,000,000.

The Atlantic Coast Fisheries Corporation, 309 Water Street, New York, has plans for remodeling and improving a building at the plant of the Groton Iron Works, Groton, Conn., to be converted for refrigerating, cold storage and other operating service. New machinery will be installed. A boiler plant will also be erected. Bilderbeck & Langdon, Inc., New London, Conn., is architect.

The Handy & Harmon Co., 620 Kings Highway, Fairfield, Conn., has plans for the immediate erection of four one-story factory units at its precious metal refining plant, to cost more than \$60,000, with equipment.

Buffalo

BUFFALO, June 27

THE King Mfg. Co., 254 Rano Street, Buffalo, has filed plans for a new one-story building, to be equipped for the most part as a foundry.

Officials of F. L. Carlisle Co., Watertown, N. Y., operating the Northern New York Utilities, Inc., and other light and power properties, have organized the Harrisville Paper Corporation, Harrisville, Lewis County, with capital of 10,000 shares of stock, no par value, to establish and operate a paper mill in this vicinity. H. E. Machold, vice-president of the Carlisle organization, will be an official of the new company. Headquarters of F. L. Carlisle & Co., are at 49 Wall Street, New York.

The Board of Contract and Supply, Syracuse, N. Y., has asked bids on a general contract for a one-story machine and repair shop for municipal work, to cost more than \$40,000 with equipment. Nelson F. Pitts, City Hall, is city engineer.

The Long Lake Light & Power Co., Long Lake, N. Y., plans the construction of a new hydroelectric power plant on site in Hamilton County, including transmission line.

The Board of Education, Buffalo, is considering the early purchase of a site for the proposed new Raymond T. Bissell vocational school, reported to cost in excess of \$450,000 with tools and equipment. James Storer, Genesee Building, is secretary. The board is asking bids until July 7 for wire fencing for schools Nos. 68, 71, 74, 75 and 76.

In connection with a fare increase, the International Railway Co., 70 West Huron Street, Buffalo, has informed the city that it will expend \$250,000 during the remainder

The Crane Market

NEW inquiry for both electric overhead and locomotive cranes is light but there are several orders pending. The Lidgerwood Mfg. Co., New York, is expected to close shortly on its list of five overhead cranes and the Amtorg Trading Corporation, 165 Broadway, New York, will probably award its list of three 25-ton locomotive cranes for Russia some time this week. No action is reported as yet on the two 20-ton locomotive cranes for the New York Central Railroad. The Watkins Structural Steel Co., 514 Watkins Street, Brooklyn, N. Y., is in the market for a used 5-ton overhead electric crane about 60-ft. span. O. B. Caldwell, 1280 Coffeen Street, Watertown, N. Y., is inquiring for a used gasoline driven shovel.

Among recent purchases are:

Lehigh Valley Railroad, New York, three 10-ton gantry cranes from the Whiting Corporation.

United Gas Improvement Co., Philadelphia, a 25-ton locomotive crane for the Iowa Electric Co., Waterloo, Iowa, from an unnamed builder.

Mississippi Valley Structural Steel Co., Melrose Park, Ill., two 5-ton, three 3-ton, four 2-ton and one 1-ton motor-driven underhung cranes and two 3-ton and three 2-ton hand power cranes from H. D. Conkey & Co.

Southern International Paper Co., Camden, Ark., a 10-ton overhead crane from H. D. Conkey & Co.

Lake St. John Power & Paper Co., Montreal, five cranes and 20 portable hoists from an unnamed seller.

Canadian Cellanese, Drummondville, Que., three overhead traveling cranes from an unnamed builder.

Spruce Falls Pulp & Paper Co., Kapuskasing, Que., 14 overhead traveling cranes from unnamed builders.

of the year for track and paving reconstruction, and other improvements, and will make purchases of equipment and materials for delivery about Aug. 15. B. J. Yungbluth is president.

Bids have been asked by the Certain-Teed Products Corporation, Niagara Falls, N. Y., for an addition to the power house at its local plant to cost approximately \$45,000. W. G. Wills, company plant, Second Street and Erie Avenue, Philadelphia, is engineer. Klipstein & Rathman, 316 North Eighth Street, St. Louis, are architects.

The Standard Oil Co. of New York, 1103 Elk Street, Buffalo, has plans for a new local refrigerating and chilling plant, including press department, to cost \$40,000.

Detroit

DETROIT, June 27.

CONTRACT has been let by the Oakland Motor Car Co., Pontiac, Mich., to the Austin Co. for a group of one-story foundries on local site. The expansion will cost in excess of \$1,500,000. No date for beginning work has been announced.

J. L. MacInerney, manager for the National Spring & Wire Co., Grand Rapids, Mich., has acquired, with a group of associates, the plant and property of the company at a public auction at a price of \$265,000. The company has been in receivership since January. The new owners plan for a reorganization of the company and continuance in manufacture.

The Century Furniture Co., Logan Street, Grand Rapids, Mich., has awarded a general contract to the Barnes Brothers Construction Co., 1809 Union Street, S. E., for a five-story addition, to cost about \$90,000 with equipment. H. L. Mead, Michigan Trust Building, is architect. W. W. Bradfield, same address, is mechanical engineer.

The Wisconsin-Michigan Power Co., Iron Mountain, Mich., formed by a recent merger of a number of electric light and power companies operating in the Peninsula district of Michigan, including the Iron Mountain Electric & Power Co., Dickinson County Public Service Co., and Wisconsin utilities in the vicinity of Appleton, has arranged for a bond issue of \$5,000,000, a portion of the fund to provide for the consolidation and for expansion in power facilities and transmission lines, substations, etc.

The Rossville Co., Lawrenceburg, Ind., manufacturer of industrial alcohol, etc., has leased the plant of the Michigan Chemical Co., Essexville, Mich., for the establishment of a new branch plant.

The Board of Education, Ferndale, Mich., plans the installation of manual training equipment in a new junior high school to cost \$225,000, for which bids have been taken on general contract.

The Board of Education, F. P. Smith Building, Flint, Mich., plans the installation of manual training equipment in its proposed three-story Longfellow junior high school to cost \$750,000, for which bids will be asked on a general contract early in July. Malcolmson & Higginbotham, F. P. Smith Building, Flint, and 1219 Griswold Street, Detroit, are architects; McColl, Snyder & McLean, Penobscot Building, Detroit, are mechanical engineers.

Clarence F. Tollzien, 2-228 General Motors Building, Detroit, has been appointed district sales representative for the Dahlstrom Metallic Door Co., Jamestown, N. Y.; the Billings & Spencer Co., Hartford, Conn.; the Waltham Watch Co., Waltham, Mass., and the Spring Perch Co., Stratford, Conn.

The James E. Degan Co., 622 First Street, Detroit, has been appointed factory representative in the Detroit district for the Dayton-Dowd Co., Quincy, Ill., manufacturer of centrifugal pumps.

Philadelphia

PHILADELPHIA, June 27.

PLANS have been filed by the Gill Glass Co., Amber and Venango Streets, Philadelphia, for a new two-story plant for which a general contract recently was let to Gorman & Frank, Upper Darby, Pa., to cost more than \$350,000 with equipment. Irwin T. Catherine, Franklin Trust Building, is architect. F. D. Gill is president.

The United Gas Improvement Contracting Co., Broad and Arch Streets, Philadelphia, a subsidiary of the United Gas Improvement Co., same address, operating public utility properties, has plans for a new six-story equipment shop, storage and distributing plant, 61 x 439 ft., with one-story automobile service, repair and garage building adjoining, 80 x 300 ft., for company motor trucks and cars, to cost more than \$500,000 with equipment. Perry, Shaw & Hepburn, 177 State Street, Boston, are architects.

The Otis Elevator Co., Sixteenth and Sansom Streets, Philadelphia, has acquired property at Nineteenth and Buttonwood Streets, 60 x 162 ft., heretofore held by the Philadelphia Motor Service Co., and plans the erection of a five-story factory branch, to cost in excess of \$175,000 with equipment. Headquarters are at Eleventh Avenue and Twenty-sixth Street, New York. The Philadelphia Motor Service Co. has plans for a new plant on Columbia Avenue, to cost close to \$75,000 with equipment. W. E. S. Dyer, Land Title Building, is architect and engineer. George F. Barcalow and Edward Dougherty head the company.

The Department of City Transit, 1211 Chestnut Street, Philadelphia, is asking bids until July 8 for electric traveling cranes and transfer table for installation in the general repair shop. H. E. Ehlers is director.

The Board of Education, Nineteenth Street, Philadelphia, is having plans prepared for a power house in conjunction with other additions to the institution on Byberry Street. The entire project will cost close to \$500,000. Irwin T. Catherine, Franklin Trust Building, is architect. The board plans the installation of manual training equipment in its proposed four-story and basement junior high school at Thompson and Montgomery Streets, to cost more than \$1,250,000 with equipment, for which superstructure will soon begin. Mr. Catherine is architect also for this structure.

The Board of City Commissioners, Bordentown, N. J., is said to be planning the installation of additional equipment in the power house of the municipal waterworks, including a Diesel oil engine unit.

The Joint School Commission, Benton, Pa., is having plans drawn for a new two-story vocational high school, to cost about \$75,000. W. Walter Witman, Keystone Building, Harrisburg, Pa., is architect.

The Galvanized Products Co., East Stroudsburg, Pa., has work under way on an addition, 40 x 81 ft., to be used as a forge department. The company is a subsidiary of the Line Material Co., South Milwaukee, Wis., manufacturer of transmission line equipment, and is arranging facilities to limit production at the local plant to substation apparatus, switches, fuses, galvanized bolts and nuts. Heretofore the plant has been given over to street-lighting equipment and similar products, which will be manufactured by the parent company at another works.

Maurice H. Dworkin, 2247 North Twenty-ninth Street, Philadelphia, manufacturer of lighting fixtures, has leased space in the building at 1021-27 Ridge Avenue for a new plant.

The Pocono Metal Mfg. Co., Stroudsburg, Pa., is arranging for increased production at its plant, to be devoted to brass bird cages, store fixtures and kindred specialties, in

addition to its regular line of brass and nicked bathroom fixtures.

Machinery and equipment at the plant of the J. W. Paxson Co., Nicetown Lane and D Street, Philadelphia, manufacturer of foundry supplies, will be offered at a public sale on the premises July 14, under the direction of a committee of creditors. Heavy machine tools, steam hammers, power shears, etc., will be included in the sale.

The Tamaqua School District, Tamaqua, Pa., contemplates the installation of manual training equipment in a new two-story high school to cost about \$175,000, for which bids will be received on a general contract July 5. D. H. Grottenboer, Schuylkill Trust Building, Pottsville, Pa., is architect.

The American Roads Machinery Co., Inc., Kennett Square, Pa., has work under way on an addition, designed largely for machinery and equipment heretofore used at the company plant at Groton, N. Y. This latter works will be entirely discontinued and production concentrated at Kennett Square.

Dr. Richard V. Mattison, president Kearsbey & Mattison Co., Ambler, Pa., has purchased the plant of the Traylor Truck Corporation, Cornwells, Pa., which will be remodeled for use by the Newtile Corporation, Ambler, Pa., a member of the group of asbestos industries headed by Dr. Mattison. This is the fourth factory to be built or purchased during the last year by the Mattison companies, the others being a new plant erected at St. Louis by the Asbestos Shingle, Slate & Sheathing Co., which has just gone into production, a new factory at Ambler recently completed by the Asbestos Buildings Co. and a plant at Asbestos Station, Pa., near Philadelphia, operated by the Ambler Asbestos Co. The Traylor plant was erected during the war for building wooden ships and consists of several one-story concrete buildings.

Chicago

CHICAGO, June 27.

SALES of machine tools have been more numerous the past week and many dealers are of the opinion that the aggregate business for June will about equal the total in May. A fair amount of old inquiry is being placed and a moderate volume of orders for individual machines is coming from widely diversified users. The Rockcastle Engineering Co., Chicago, has purchased three lathes, two drill presses, a miller, planer, shaper and miscellaneous grinding equipment. The Missouri Pacific has placed several tools, including a 24-in. slotter, and an instrument maker in Chicago has ordered a 20-in. shaper.

New inquiry includes a 36-in. draw-cut shaper and a 16-in. lathe for the Northern Pacific, and several drop forge die makers are interested in shapers and planers. A list of 16 experimental department tools asked for by the Studebaker Corporation, South Bend, Ind., and later canceled, may be revived during the summer. Several large machine tools on the Santa Fe list have not been placed, and John Deere & Co., Waterloo, Iowa, still have several items pending.

The Terminals & Transportation Corporation of America has acquired seven acres on the west side of the Calumet River, between 103rd and 104th Street, Chicago, as a harbor terminal site. The construction of docks and sheds and switch track connections will begin soon.

U. J. Rockcastle formerly with the Hydraulic Engineering Co., Chicago, has organized the Rockcastle Engineering Co., 711 Fulton Street, Chicago, to do general machine and repair work.

The McVoy Sheet & Tin Plate Co., formerly at 344 West Austin Avenue, Chicago, has removed its offices and job galvanizing department to 1050-1058 West Thirty-sixth Street where its two galvanizing plants and warehouses are now concentrated.

The Wodack Electric Tool Corporation, Chicago, is occupying its new building at 4627-4629 West Huron Street.

The Johnson Motor Co., Waukegan, Ill., has awarded a general contract to the Austin Co., for a new one-story plant, 300 x 360 ft., with two-story office and operating department, 75 x 200 ft., to cost \$200,000 with equipment. Headquarters of the company are at South Bend, Ind.

The Chicago Tool & Kit Mfg. Co., 160 Whiting Street, Chicago, has leased space in the building at 429 West Superior Street, totaling about 6000 sq. ft. of floor area for a new plant. The present works will be removed to the new location.

The Standard Oil Co., Austin, Minn., has completed

plans for a new oil storage and distributing plant to cost about \$45,000 with equipment.

The Board of Education, Council Bluffs, Iowa, is asking bids on a general contract until July 5 for a one-story addition to the manual training building at the school at Broadway and Twenty-fifth Street. George A. Spooner, Park Building, is architect.

The Illinois Power & Light Corporation, 231 South La Salle Street, Chicago, operating properties at Bloomington, Peoria, Danville and other parts of the State, has arranged for a bond issue of \$4,000,000, a portion of the fund to be used for expansion and betterments.

The Heff Mfg. Co., North Chicago, Ill., manufacturer of incubators and kindred products has completed plans for a new one-story factory, 80 x 200 ft., sawtooth roof type, to cost about \$35,000. L. J. Latz, Waukegan, Ill., is architect.

The Dallas Dome Oilfields Co., Lander, Wyo., is considering the construction of a new oil refinery on local site, to cost in excess of \$600,000 with machinery.

The Minnesota Power & Light Co., Duluth, Minn., has issued bonds for \$1,500,000, a portion of the fund to be used for extensions and improvements.

The Central Steam Heat & Power Co., 105 Montana Avenue, Madison, Wis., is said to be planning the construction of a new central power plant at Freeport, Ill., to cost close to \$500,000 with equipment.

The Maizwood Products Co., Hugh Brennan, president, 209 South State Street, Chicago, is taking bids on a general contract for the first unit of its proposed plant at Dubuque, Iowa, for the manufacture of wallboard products, to cost close to \$100,000 with machinery. E. H. Hussey is company engineer.

The Minnesota Northern Power Co., Miles City, Mont., has plans for a new one-story steam-operated electric power house for service in this section, using natural gas as fuel. The C. M. Garland Co., 38 South Dearborn Street, Chicago, is engineer.

The Hanson Clock Co., Eleventh Street, Rockford, Ill., has filed plans for a two-story addition, 50 x 140 ft., to cost about \$45,000 with equipment. A general contract has been let to Linden & Son, Inc., 1110 Tenth Street.

Public sale of the good will, machinery and real estate of Henry E. Pridmore, Inc., Chicago, was confirmed by a court order on June 24. The good will was sold to the International Molding Machine Co., Chicago, and the machinery and buildings were taken over by the Madison & Kedzie Bank for disposal to bidders at the public sale.

Cleveland

CLEVELAND, June 28.

MACHINE tool sales continue light. Business was not so good the past week as during the one previous, inquiry also having fallen off. Few orders are for more than single machines, and the June volume is expected to fall somewhat below that of May. There is not much activity or prospective business in Detroit. The Ford Motor Co. during the week purchased a planer and a few special tools. There is a moderate local demand for presses; one manufacturer sold 12 presses in this city during the week, three to the Guide Motor Lamp Mfg. Co., the remainder being single orders. The Cleveland Board of Education has purchased most of the machines specified in its recent list of 13 tools.

The Kindt-Collins Co., 1030 St. Clair Avenue, Cleveland, maker of supplies, has awarded contract for a two-story and basement factory building, 40 x 71 ft.

R. W. Halliday, 10501 Euclid Avenue, Cleveland, has commenced the erection of a one-story 85 x 200 ft. metal stamping plant on Richmond Avenue near East Ninety-third Street. The Carter Richards Co., Engineers Building, is the architect.

The Cleveland Chain & Mfg. Co., Bedford Road, Cleveland, has placed contract for a two-story, 50 x 110 ft., factory addition.

The Ohio Forge Co., 2955 East Ninety-second Street, Cleveland, has awarded contract for a one-story, 50 x 80 ft., addition.

The T. Brandt Furniture Co., Celina, Ohio, is completing plans for a new two-story factory, to cost close to \$50,000 with machinery. A. F. DeCurtins, Ellerman Building, Lima, Ohio, is architect.

The All-In-One Motor Co., Newton Falls, Ohio, manufacturer of gasoline engines, is said to be planning a new one-story factory, 52 x 100 ft., to cost more than \$45,000 with equipment.

The American Brass Mfg. Co., 1521 East Forty-ninth Street, Cleveland, is completing plans for a new two-story and basement addition, 22 x 75 ft., to cost close to \$45,000 with equipment.

South Atlantic States

BALTIMORE, June 27.

BIDS will soon be asked by the Cumberland & Western Port Electric Railway Co., Cumberland, Md., for a two-story automobile service, repair and garage building at Frostburg, Md., for motor buses and cars, to cost about \$75,000. D. D. Price is manager.

The New York Improved Patents Corporation, New York, recently organized, has negotiations under way for the purchase of the Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, manufacturer of metal bottle caps and bottle-sealing machinery. The company also will purchase the plant and business of the New Process Cork Co., 68 Thirty-fifth Street, Brooklyn, N. Y., manufacturer of similar products, and will consolidate the two organizations. An expansion program is planned.

The Board of City Commissioners, Trappe, Md., is asking bids until July 11 for a complete pumping plant for the municipal water system, including pumping unit, engine and air compressor; also for a 50,000-gal. steel water tank, supported on 50-ft. steel tower. Kastenhuber & Anderson, Easton, Md., are engineers. O. L. Corkran, Jr., is secretary.

The Hackney Mfg. Co., Lexington, N. C., recently formed with a capital of \$200,000, has plans under way for a new plant to manufacture chairs and other furniture, to be two stories, 60 x 145 ft., with two one-story extensions, 20 x 60 ft., and 25 x 40 ft., and to cost more than \$85,000 with machinery. It is understood that the plant will replace the factory of the Lexington Chair Co., lately destroyed by fire.

The Board of District Commissioners, Washington, is asking bids until July 12 for two trucks with dump body, for use at the district repair shops.

The Hackley Morrison Co., Inc., 204 North Jefferson Street, Richmond, Va., machinery dealer, has inquiries out for a belt-driven air compressor, about 250 cu. ft. per min. capacity, Ingersoll-Rand type preferred; also for a quantity of 8-in. diameter black pipe.

The Board of Education, Harrisonburg, Va., plans the installation of manual training equipment in a proposed new high school group to cost in excess of \$300,000. Plans for the first unit, to cost approximately \$170,000, are being drawn by Charles M. Robinson, Times-Dispatch Building, Richmond, Va., architect.

The Duke Power Co., Charlotte, N. C., has concluded arrangements for the acquisition of a controlling interest in the North Carolina Public Service Co., Winston-Salem Gas Co., South Carolina Gas & Electric Co., and the Blue Ridge Power Co., all held heretofore by the General Gas & Electric Co., 50 Pine Street, New York. The new owner plans for the development of the different utilities, including increased power facilities, additional transmission lines, etc. It has secured also a half interest in the new hydroelectric generating plant to be constructed on the Saluda River by the Lexington Water Power Co., Lexington, N. C., likewise owned by the General Gas & Electric Co.; work on the last noted project will soon be placed under way.

The Carolina Power & Light Co., Raleigh, N. C., has plans nearing completion for new car barns and repair shop for its local traction system, to cost upward of \$150,000 with equipment. It is expected to ask bids at once.

The Board of City Commissioners, Rockingham, N. C., is asking bids until July 7 for a complete water purification plant, 1,000,000-gal. capacity, for the municipal waterworks. The Carolina Engineering Co., Johnston Building, Charlotte, N. C., is engineer. Zebulon Gibson is clerk.

James McCrea & Son, 19 North Carrollton Avenue, Baltimore, contractors, have awarded a general contract to the M. A. Long Co., 10 West Chase Street, for a new one-story equipment repair, storage and distributing building to cost about \$45,000.

The Board of Education, Richmond, Va., contemplates the installation of manual training equipment in a new high school to cost more than \$400,000, for which plans will be drawn by C. M. Robinson, Times-Dispatch Building, architect.

The Western Maryland Railroad Co., Baltimore, is reported to be completing plans for rebuilding the portion of its locomotive repair shops at Elkins, W. Va., recently destroyed by fire, with loss estimated at close to \$100,000 including equipment.

The Southern Power Co., Charlotte, N. C., has work under way on a new hydroelectric power plant on the Yadkin River, near High Rock, N. C., to cost in excess of \$500,000 with power dam and transmission system.

The Easton Utilities Commission, Easton, Md., is asking bids until July 11 for a steel water tank, 250,000 gal. ca-

capacity, supported on steel tower 50 ft. high. E. G. Kastenhuber, Jr., is town engineer. John S. McDaniel is secretary.

Ironclad, Inc., 817 Fourteenth Street, Northwest, Washington, has been organized to manufacture a new type of insulated steel deck roof, for which patent has been applied for by H. Thurber. The company has a factory at Ninth and Evarts Streets, Northeast, and is manufacturing its roofing of galvanized copper steel and plain black copper steel, designed primarily for use on industrial buildings and airplane hangars. The company has secured the contract for roofing on the Pensacola hangars of the United States Navy, and is in the market for copper steel sheets from 18- to 24-gage, both black and galvanized.

Cincinnati

CINCINNATI, June 27.

JUNE has turned out to be disappointing from the standpoint of fresh bookings, the month showing a decline when compared with May. Local builders estimate that orders in the first six months of 1927 totaled from 70 to 80 per cent of those in the same period last year. The decrease is accounted for largely by the meager purchases made by automobile makers who a year ago constituted the most important single source of machine tool business.

The Ford Motor Co. is reported to have bought a number of special machines and is expected to contract for further equipment the coming week. While the Cincinnati Street Railway Co. has not formally issued a list, it is known that the company will buy seven engine lathes, one or two car-wheel lathes, a planer, two drills, two boring mills, a shaper and a turret lathe. The total expenditure probably will run well over \$100,000. The Rock Island has contracted with a local manufacturer for two engine lathes, while the Illinois Car & Mfg. Co., Hammond, Ind., has taken a 48-in. car-wheel borer.

The Dayton Lens & Glass Beveling Works, Dayton, Ohio, has acquired a site at 723 South Main Street, and will erect a one-story plant, 50 x 165 ft., to cost approximately \$40,000 with equipment.

The State Department of Highways and Public Works, Columbus, Ohio, has plans for a one-story service and repair shop, and garage, 75 x 300 ft., at Chillicothe, Ohio, to cost close to \$75,000 with equipment. H. B. Briggs, Ohio-Hartman Building, Columbus, is architect.

The Taylor Plow Co., Cleveland, Tenn., recently organized to manufacture tractor plows and other agricultural equipment, has acquired property on South Warehouse Street, and will erect a new plant, consisting of two buildings, 50 x 125 ft., and 50 x 50 ft., respectively. W. T. and Hal B. Moore, both of Cleveland, head the company.

Louis H. Bull, Chattanooga, Tenn., architect, is asking bids on a general contract until July 8 for a four-story automobile service, repair and garage building, 130 x 140 ft., to cost about \$200,000 with equipment.

The Board of Education, Dayton, Ohio, is said to be considering the installation of manual training equipment in its proposed Colonel White junior high and grade school to cost \$450,000, for which superstructure will soon begin.

The Steel Products Engineering Co., Springfield, Ohio, has work under way on an addition to cost more than \$35,000, and expects to begin equipment installation soon.

Pfell & Awsumb, Dermon Building, Memphis, Tenn., architects, will soon begin superstructure for a new two-story automobile service, repair and garage building, 100 x 125 ft., to cost \$75,000 with equipment.

The Herron Stove & Foundry Co., Chattanooga, Tenn., care of H. L. Thatcher, 1910 Central Avenue, recently formed by Mr. Thatcher and associates with a capital of \$50,000, is said to have secured a lease on the property of the American Brake Shoe & Foundry Co., and will occupy for a new foundry. Frank T. Herron, Lookout Mountain, Tenn., will be president of the new company.

The Union Gas & Electric Co., Cincinnati, is concluding arrangements for the purchase of the Cincinnati & Suburban Power Co., operating at Milford, Newton, Fayetteville, and vicinity, for \$451,000. The new owner will consolidate with its system, and plans extensions and improvements.

The Eco-Thermal Stove Co., Lebanon, Ohio, is said to be planning to rebuild the portion of its plant destroyed by fire June 15, with loss reported in excess of \$150,000 with equipment.

The Southland Coal Co., Henderson, Ky., is considering rebuilding the tippie at its mine No. 2, recently destroyed by fire, with loss reported at close to \$35,000 with machinery.

The Department of Public Service, Hamilton, Ohio, has authorized an immediate call for bids for its proposed municipal electric light and power plant, to cost \$500,000 with equipment. Froelich & Emery, Second National Bank Building, Toledo, Ohio, are engineers. Guy C. Mitchell is service director.

The Strelne Tool & Mfg. Co., New Bremen, Ohio, is planning the erection of an addition to its plant to take care of its increased business.

Indiana

INDIANAPOLIS, June 27.

CONTRACT has been let by the Home Telephone & Telegraph Co., 303 East Berry Street, Fort Wayne, Ind., to Henry Wehrenberg & Son, Farmers' Trust Building, for a two-story equipment storage and distributing plant, with repair department, to cost close to \$100,000 with equipment. C. R. Weatherhogg, 250 West Wayne Street, is architect.

The Utilities Power & Light Corporation, Indianapolis and St. Louis, operating the Indianapolis Power & Light Corporation and other power utilities, has arranged for a bond issue of \$20,000,000, a portion of the proceeds to be used for extensions and betterments and the acquisition of other properties. H. L. Clarke is president.

The Board of Education, Indianapolis, is having plans drawn for a new building at the technical high school, 1500 East Michigan Street, to cost \$450,000. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects. Ure M. Frazier is business director.

The Auburn Automobile Co., Auburn, Ind., has arranged for an increase in capital from 120,000 to 500,000 shares of stock, no par value, a portion of the proceeds to be used for expansion. The company has plans for an addition to its plant to provide about 60,000 sq. ft. floor space.

Thornton & Rodecker, 658 Fairfield Avenue, Indianapolis, architects, have plans under way for a new nine-story automobile service, repair and garage building to cost upward of \$300,000 with equipment.

The DeRhodes-Yerrick Motor Co., 222 North Lafayette Street, South Bend, Ind., representative for the Dodge automobile, has awarded a general contract to William W. Lechlitner, Mishawaka, Ind., for a new one-story and basement service, repair and garage building, 66 x 135 ft., at Mishawaka to cost about \$70,000 with equipment.

The Maring Wire Co., Muskegon, Mich., has begun the erection of a branch plant at Anderson, Ind., with 25,000 sq. ft. of manufacturing space. It will be given over to the production of insulated copper wire.

The American Lawnmower Co., Eighteenth and Monroe Streets, Muncie, Ind., will build an addition to cost \$12,000.

Milwaukee

MILWAUKEE, June 27.

NEW machine tool business is coming in slowly, and while most shops are maintaining a moderate rate of production, deliveries exceed bookings. Customers are buying little beyond urgent replacement needs. The fact that skilled machinists are in active demand, with a small supply, is an encouraging feature.

Smith Laboratories, Inc., Milwaukee, has been incorporated with a capital stock of \$25,000 to manufacture pneumatic clutch controls, oil sediment traps and other specialized automotive equipment and accessories. Plans for production are now being formulated. The principals are Raymond Smith, 644 Eighteenth Avenue; Galbraith M. Smith and Halbert D. Jenkins.

The Rundle Mfg. Co., Twenty-seventh and Cleveland Avenues, Milwaukee, manufacturer of plumbing supplies, enameled ware, etc., has let the general contract to the William F. Tubising Co., Wauwatosa, Wis., for the construction of additions to the foundry, main shop and power plant, and for general alterations in the existing plant, the investment to be about \$75,000. The project is in charge of Charles A. Cahill & Son, engineers, 217 West Water Street, Milwaukee.

The city of Kenosha, Wis., has engaged Alvord, Burdick & Howson, consulting engineers, 8 South Dearborn Street, Chicago, to prepare plans and estimates of an extension of the filtration unit of the municipal waterworks plant to cost about \$100,000. P. J. Hurtgen is director of public works.

The South Side Wet Wash Laundry Co., 641 Fifteenth Avenue, Milwaukee, contemplates the erection of a new plant at Muskego Avenue and Arrow Street, to cost \$200,000 or more, including engines, boilers, tanks, motors, etc. William Luetzow is president and manager.

The American Hair Felt Co., Forty-fourth and State Streets, Milwaukee, will enlarge its power plant by an addition, 34 x 88 ft., costing about \$35,000 with equipment. The general contractor is John L. Stanage, 3526 Cedar Street, local.

Gulf States

BIRMINGHAM, June 27.

PLANs are being considered by the Standard Mfg. & Engineering Corporation, P. O. Box 553, Jacksonville, Fla., for a new one-story machine shop to cost about \$24,000. The company is understood to be in the market for tools and equipment.

The Houston Lighting & Power Co., Houston, Tex., is disposing of a bond issue of \$2,000,000, a portion of the proceeds to be used for extensions and improvements.

The Merchants' Transfer Co., 215 Main Avenue, San Antonio, Tex., F. Canaday, president, has plans under way for a new four-story cold storage and refrigerating plant, to cost approximately \$450,000 with equipment. An automobile service, repair and garage building for company trucks will be built at the same location, to cost about \$150,000 with equipment.

The Lone Star Gas Corporation, Dallas, Tex., is considering the rebuilding of its gasoline refinery near Gordon, Tex., destroyed by fire June 18, with loss reported at \$100,000 including equipment.

The Mississippi Power & Light Co., Jackson, Miss., is said to be planning the construction of a new power plant in the vicinity of Goodman, Miss., for local commercial service.

The Alamo Iron Works, Inc., 130 Santa Clara Street, San Antonio, Tex., is said to have plans under way for a new plant on site acquired at Corpus Christi, to consist of a main two-story unit, 125 x 300 ft., and smaller structures, to cost in excess of \$65,000 with equipment. The company is also considering the erection of a steel fabricating works. Melrose Holmgree is secretary.

The Humble Oil Co., Houston, Tex., has work in progress on a new pipe line from the West Texas oilfields to Corpus Christi, Tex., to cost in excess of \$700,000 with booster stations, etc. G. A. Lee, Sonora, Tex., is superintendent.

The Texas-Louisiana Power Co., Fort Worth, Tex., is planning the construction of a new power plant at San Marcial, New Mexico, to replace a station destroyed by fire several weeks ago. The new plant will cost more than \$50,000 with equipment.

The Winn Produce Co., Big Springs, Tex., has plans for a new cold storage and refrigerating plant to cost about \$45,000 with equipment.

The Dillon Machine Shops, Ferriday, La., are planning for a two-story addition, 50 x 75 ft., to cost close to \$23,000 with equipment. George F. Dillon is head.

The Southern Sugar Co., Clewiston, Fla., care of B. G. Dahlberg, president of the Celotex Co., 645 North Michigan Avenue, Chicago, lately organized by Mr. Dahlberg and associates, has preliminary plans for a new cane sugar refinery at Clewiston, to cost upward of \$2,000,000. The company has arranged for a preferred stock issue to total about \$3,250,000, the fund to provide in part for the new plant. Mr. Dahlberg will be president of the new company; other officers include Charles G. Rhodes, T. A. Burt and F. L. Williamson.

The Board of Trustees, Brenham Independent School District, Brenham, Tex., has plans for a manual arts building in connection with a new high school. The project will cost about \$175,000. Giesecke & Harris, 207 West Seventh Street, Austin, Tex., are architects.

The City Council, Ocala, Fla., is considering a report made by J. N. Eley, city manager, for a proposed municipal electric light and power plant to cost \$185,000.

H. and R. Long, Birmingham, have awarded a general contract to the Mackle Shepherd Co., 615 South Twenty-seventh Street, for a one-story wagon shop and truck works, 50 x 190 ft., to cost close to \$20,000 with equipment.

The Louisiana Power & Light Co., Pine Bluff, Ark., has begun enlargements in its power plant at Sterlington, La., to more than double the present capacity, to cost in excess of \$450,000 with machinery. Ford, Bacon & Davis, Inc., 115 Broadway, New York, is consulting engineer.

The Efficiency Pumps & Compressor Co., Second National Bank Building, Houston, Tex., has inquiries out for a number of machine tools, including 16-in. x 9-ft., geared-head lathe; universal milling machine with double over arm and spiral, and 36-in., four-jaw boring mill; also for a gasoline locomotive and gasoline shovel.

The Fuel Efficiency Engineering Corporation has been organized at Birmingham to market equipment for burning powdered coal. James W. Whatley is president of the new company, which is capitalized at \$100,000. The first apparatus is being built by the Hardie-Tynes Mfg. Co. Mr.

Whatley was for more than 20 years in charge of sales of coal and coke for the Tennessee Coal, Iron & Railroad Co. W. E. Pettibone, vice-president and chief engineer, was formerly engaged in manufacturing similar equipment at Erie, Pa.

St. Louis

ST. LOUIS, June 27.

CONTRACT has been let by the Board of Public Service, City Hall, St. Louis, to the McCormack-Coombs Construction Co., Columbia Building, for a three-story mechanical service building to cost close to \$1,000,000 with machinery. Study & Farrar, Arcade Building, are architects.

Brinkman & Hagan, Citizens National Building, Emporia, Kan., architects, have plans for a two-story and basement automobile service, repair and garage building, 75 x 125 ft., to cost about \$95,000 with equipment.

The Vulcan Steel Corporation, Tulsa, Okla., has begun the erection of a new plant for the manufacture of patented machinery for gasoline refining and other oil service, including parts and assembling departments, to cost in excess of \$70,000 with equipment. A 15-ton traveling crane will be installed.

David Reed, Poteau, Okla., is at the head of a project to construct and operate an electric light and power plant in the vicinity of Howe, Okla., for service at the coal mining properties in this section. A transmission line will be built. Arrangements are said to have been made with the Oklahoma Gas & Electric Co., Oklahoma City, Okla., for the sale of surplus power from the new station. The entire project will cost in excess of \$350,000 with equipment.

The Alois Aufrechtig Copper & Sheet Iron Mfg. Co., 900 South Third Street, St. Louis, has acquired property on Delor Street and will erect a new one- and two-story plant, to cost about \$85,000 with equipment.

The Southwestern Bell Telephone Co., St. Louis, is planning to rebuild the portion of its equipment repair, storage and distributing plant at Joplin, Mo., with automobile service and garage building, recently destroyed by fire, with loss reported at \$60,000 including equipment.

The Union Tank Car Co., 134 North La Salle Street, Chicago, has plans for a new tank car shop at Neodesha, Neb., to cost more than \$50,000 with equipment.

The United Light & Power Co., Hutchinson, Kan., has authorized the immediate erection of an addition to its local steam-operated electric light and power plant, to cost \$35,000 with equipment. J. H. Mullison is plant superintendent.

The Board of Public Service, City Hall, St. Louis, has rejected bids recently received for six mechanical draft fans for the preheater room in the power house at the Howard Bend pumping station and is expected to ask new bids soon. O. D. Tillay is secretary.

The Common Council, Cabool, Mo., is planning the installation of deep-well pumping equipment and 60,000-gal. steel tank on steel tower, in connection with a proposed municipal water system. The entire project will cost \$39,000.

The National Packers' Supply Co., Inc., St. Louis, has awarded a general contract for a new one-story factory, 110 x 130 ft., to cost more than \$85,000 with equipment. George Birkland, 405 Franklin Street, is consulting engineer.

The Southern Kansas Stage Line, Wichita, Kan., is planning the construction of a bus service, repair and garage building to cost about \$70,000 with equipment. Glenn H. Thomas, Wichita, is architect.

The St. Louis-San Francisco Railway, Railway Exchange Building, St. Louis, is said to be arranging for the immediate erection of a new engine house with repair facilities at Yale, Tenn., to cost \$80,000 with equipment.

The Fulton Iron Works, St. Louis, has received a contract from the Compania Tabacalera, Barcelona, Spain, for a \$2,000,000 sugar mill to be erected in Tarlac Province, in the Philippines. H. J. Steimbredner, president Fulton Iron Works, reports a substantial number of contracts for sugar mill machinery so far this year.

Pittsburgh

PITTSBURGH, JUNE 27.

THE machine tool trade is showing the usual summer dullness. The steel industry, which has considerable influence upon general business in this part of the country, recently has been experiencing quiet times, and activities are below those at this time last year.

The Republic Foundry Co., 515-17 Reedsdale Street, Pittsburgh, is contemplating the manufacture of patented articles and will probably buy some die-casting machinery.

Officials of the Pennsylvania Glass Sand Co., Lewistown, Pa., have formed the Pennsylvania Glass Sand Corporation, to take over the plants and properties of the present company and five other organizations in the same line. The new organization has arranged for a bond issue of \$5,000,000, the proceeds to be used to complete the merger and to carry out an expansion and improvement program at the different silica properties, situated primarily in the Oriskany Vein. The Berkeley Glass Sand Co., Berkeley, W. Va., will comprise a unit of the consolidation. A. J. Fink is chairman of the board of the new corporation; W. J. Woods is president; and H. P. Bridges, vice-president.

The Altoona School District, Altoona, Pa., plans the installation of manual training equipment in a new three-story senior high school estimated to cost \$750,000, for which bids will soon be asked on a general contract. Hersh & Shollar, Commerce Building, are architects. The Frank Irving Cooper Corporation, 172 Tremont Street, Boston, is consulting architect.

The West Virginia Gas Corporation, Charleston, W. Va., recently formed to take over and consolidate a number of natural gas properties in this vicinity, has arranged for a bond issue of \$3,000,000, a portion of the fund to be used for property acquisition and for extensions and betterments in plants and pipe lines.

The Carbide & Carbon Chemical Corporation, South Charleston, W. Va., is said to have concluded arrangements for the purchase of Blaine Island as a site for new plant units, to cost in excess of \$200,000 with machinery.

The Brilliant Glass Products, Inc., Brilliant, Ohio, manufacturer of railroad signal glasses, signal reflectors, radio insulators, automobile glassware, etc., is reported to be concluding arrangements for the purchase of property at Weston, W. Va., as a site for a new plant. It is purposed to remove the present business to the new location and install additional equipment for increase in output. W. N. Matthews, now connected with the company at Brilliant, will be in charge of the new works. The Chamber of Commerce, Weston, is interested in the project.

The Parkersburg Independent School District, Parkersburg, W. Va., contemplates the installation of manual training equipment in a proposed new junior high school to cost \$200,000.

The American Water Works & Electric Co., 50 Broad Street, New York, has concluded negotiations for the purchase of the electric light and power, natural gas, water-works and other utility properties at Morgantown, W. Va., heretofore held by the West Virginia Utilities Co. The new owner will transfer the properties to the Monongahela-West Penn Public Service Co., a subsidiary, which plans expansion and improvements.

The Lincoln Laboratories, Lincoln, Pa., has been making inquiries for pulverizing machinery for tobacco service, capacity up to 200 mesh.

Pacific Coast

SAN FRANCISCO, June 22.

THE Bakersfield Iron Works, Bakersfield, Cal., recently acquired by new interests headed by F. A. Hopper. Hopper Machine Works, Kern River oil fields, near Bakersfield, has plans under way for expansion, including additional facilities for the production of iron and steel castings. It is proposed to consolidate the two organizations into a new company capitalized at \$300,000, of which Mr. Hopper will be head.

The Southern California Edison Co., Los Angeles, will soon break ground for a one-story equipment repair, storage and distributing plant, 100 x 110 ft., at Redlands, Cal., to cost about \$60,000 with equipment. The company also plans for a similar structure at Ventura, Cal., to cost approximately a like sum.

The White Crown Products Co., Los Angeles, Edward Duryee, president, is reported to be planning the construction of a new cement mill near Ventura, Cal., to cost upward of \$800,000 with machinery.

The Pratt Furniture Co., 1431 Third Street, Santa Monica, Cal., has awarded a general contract to Wilson Brothers, local, for a new three-story plant, 72 x 110 ft., to cost close to \$75,000 with equipment.

The White Motor Co., 842 East Seventy-ninth Street, Cleveland, manufacturer of motor trucks, is considering the erection of a new factory branch at Spokane, Wash., to cost more than \$50,000 with equipment.

The Landes Oil Products Co., Spokane, Wash., W. B. Landes, vice-president, has plans under consideration for the construction of a gasoline refinery with by-products division, to cost close to \$200,000 with equipment. The plant will be used largely to handle the output of the Big West Oil Co., operating in the Kelvin district, Mont.

The Western Paper Products Co., Salt Lake City, Utah, C. P. Castle, general manager, has acquired property at Fourth Street, West, and South Fifth Street, and is said to be planning the erection of a new factory to cost more than \$45,000 with equipment.

The West Coast Foundry Co., Los Angeles, has plans for a one-story foundry, totaling about 12,000 sq. ft. of floor space, on a 2-acre tract, to cost close to \$40,000 with equipment. The company plans additional units later. The Industrial Building Co., Pacific National Bank Building, is architect.

The Glendale Union High School District, Glendale, Cal., has approved a bond issue of \$1,400,000 for new high school buildings, including manual arts departments. Plans for the initial group will be prepared at once and will include a one-story vocational shop building, with entire project to cost \$1,000,000. Alfred F. Priest, Fay Building, Los Angeles, is architect. The board has also authorized the construction of a one-story manual arts building at the present Broadway High School, to cost approximately \$100,000 with equipment. George M. Lindsey, Union Insurance Building, Los Angeles, is architect for the last noted structure.

The City Council, Long Beach, Cal., has authorized the construction of a municipal airport, including hangars, shops, oil storage and other buildings, to cost about \$25,000 exclusive of equipment.

The Salt River Valley Water Users Association, Phoenix, Ariz., is reported to be planning the construction of a power dam and hydroelectric power plant in the Stewart Mountain district on the Salt River, to cost in excess of \$1,500,000.

The Reliance Mfg. Co., Alhambra, Cal., manufacturer of gas and railroad appliances and a subsidiary of the Reliance Foundry Co., has plans for the immediate construction of a plant to cost \$150,000. W. N. Thompson is president of the manufacturing company and A. C. Thompson heads the foundry.

Foreign

THE Mexican Power & Light Co., Ltd., Mexico City, Mexico, has arranged a fund of 28,000,000 pesos (about \$14,000,000), for extensions and improvements in its power plants and system, including construction now in progress. The work will consist of the development of additional hydroelectric power facilities, new transmission lines, substations and distributing systems. The company has recently diverted the waters of the Hecaza River for a group of small hydroelectric power plants at Necaxa, Tepaxie, Laguna and other points.

The Amtorg Trading Corporation, 165 Broadway, New York, has signed a contract with the Soviet Naptha Syndicate, Russia, to act as its sole purchasing agent in the United States, and all equipment and machinery required in the future will be handled through this source. The Naptha syndicate recently concluded arrangements with the Standard Oil Co., 26 Broadway, New York, for the construction of several oil refineries in the Black Sea district, and work on this project will begin soon. Saul G. Bron is chairman of the Amtorg organization. M. E. Kalnin is vice-chairman of the Naptha syndicate.

The Goodyear Tire & Rubber Co., Akron, Ohio, will soon begin the erection of its proposed mill near Sydney, Australia, and the first unit is scheduled to be ready for operation in November. The Australian Goodyear Co., Ltd., has been formed as a subsidiary to carry out the project, capitalized at \$4,000,000. A preferred stock issue of \$1,500,000, has been sold in Australia, a considerable portion of the fund to be used for the mill, which will be equipped for an initial output of 1400 tires per day. The plant will be the first American-owned rubber mill in that country. The parent company has plans also for the establishment of a branch plant in Europe.

Alexis Ivanovitch Rikov, chairman of the People's Commissaries, Moscow, Russia, is arranging for the early construction of a new plant for the manufacture of agricultural machinery and equipment. The project will include also a division for the production of tractors, as well as a general metal-working plant. An affiliated project now under consideration by the same organization provides for the early construction of an oil refinery.

The Government of Hawaii, Honolulu, has approved an appropriation of \$2,500,000 for harbor improvements during the next 24 months, including the construction of wharves and installation of material-handling equipment, including conveying machinery, travelling cranes, loading equipment, etc. The Chamber of Commerce, Honolulu, has information regarding the project.

Canada

TORONTO, June 27.

WHILE machine tool sales can hardly be called brisk, the demand is said to be satisfactory and orders closed this month compare favorably with those of any month this year. The first six months of this year sales greatly exceeded those for the first half of 1926. During the month of April tools purchased from the United States had a value of \$145,076, and those from the United Kingdom, \$23,199. For the twelve months ended with April imports of tools from the United States were valued at \$1,797,569, and those from the United Kingdom at \$274,138.

The Montreal Coke Mfg. Co., St. Patrick Street, Montreal, will start work at once on the erection of a plant at Ville Lasalle, Que., to cost \$5,000,000. It will consist of a number of buildings of reinforced concrete and will be under the supervision of F. S. Wise, erection engineer of the company.

The Canadian William Rogers, Ltd., 570 King Street, West, Toronto, Ont., will build an addition to its plant. The Carswell Construction Co., C. P. R. Building, Toronto, is general contractor.

The U. S. Playing Card Co., Sandwich Street, Windsor, Ont., contemplates the erection of a new factory.

Plans are being prepared for a \$20,000 factory addition for the Seiberling Rubber Co., Toronto. James, Proctor & Redfern, Ltd., 36 Toronto Street, is engineer.

The St. Lawrence Paper Mills, Ltd., 1001 Canada Cement Building, Montreal, is contemplating building a paper mill at Nipigon, Ont. Engineers have not yet been appointed.

The Victor Talking Machine Co. of Canada, Ltd., St. Henry Street, Montreal, will build an addition to its local factory. Ross & Macdonald, 1 Belmont Street, are architects.

The Canadian Pacific Railway Co., Windsor Station, Montreal, will build an addition to its engine house at Guelph, Ont.

Bids are being received by Thomas Foster, chairman of the Board of Control, Toronto, until July 12, for switching equipment and appurtenances for the main pumping station; specifications at Room 12, City Hall.

The Perfection Glass Co., Ltd., Montreal, manufacturer of non-breakable, bullet-proof glass, has purchased the plant, patents and property of the Toronto Plate Glass Importing Co., Ltd., Toronto. The new owner will continue operations of the acquired company, adding its special lines to the products formerly turned out in the Toronto plant. James A. Watt is president of the Perfection Glass Co., Ltd.

Officials of the Canadian National Railways, head office Montreal, have an improvement program for this year which will include the building of an addition to the engine house at Kamloops, B. C., and facilities for handling locomotives at Windsor, Ont., and Charlottetown, P. E. I. Construction work will start this year on a locomotive erection shop at Point St. Charles, Que. Coaling plants, each of 100 tons capacity will be established at Kamloops, and Prince Rupert, B. C.

A. J. F. Montabone is consulting engineer in charge of the proposed hydroelectric development of 8000 hp., on the Jacques Cartier River for the Donnacona Paper Co., Ltd., Montreal.

Tenders have been closed for the construction of a new wire mill at Brockville, Ont., to cost approximately \$50,000 for the Eugene F. Phillips Electrical Works, Ltd., Montreal. Plans have been prepared by J. M. Millar, architect, 364 Dorchester Street, Montreal.

Western Canada

The City Council, New Westminster, B. C., is contemplating the purchase of an electric pump to cost \$6,000.

The Quaker Oats Co., Saskatoon, Sask., is having plans prepared for the erection of a mill to cost \$750,000. Work will start this fall or early next spring. Thomas Reynolds, Saskatoon, is manager.

Plans are being prepared and construction work will start immediately on a contract process sulphuric acid plant at Trail, B. C., for the Consolidated Mining & Smelting Co. The plant will make sulphuric acid from the smelter fumes, and the first unit will cost approximately \$250,000. The Consolidated Mining & Smelting Co. is preparing to go ahead with other plans for improvements and additions.

The Imperial Oil Co., Ltd., will build an oil plant and office building at Vancouver, B. C., to cost \$250,000. Tenders for the work will be called soon by Townley & Matheson, architects, 325 Homer Street, Vancouver.

NEW TRADE PUBLICATIONS

Column Facing Machines.—Consolidated Machine Tool Corporation of America, Newton Works, Rochester, N. Y. Bulletin 115, describing and illustrating the Newton type T column facing machines of the hand feed, power feed and duplex models.

Slush Pumps.—Wilson-Snyder Mfg. Co., Pittsburgh. Bulletin W-58B, devoted to the company's No. 18 long stroke slush pump for deep drilling. The pump has a 14 x 7 x 18 in. stroke, and is of the direct flow type.

Diesel Engines.—De La Vergne Machine Co., 977 East 138th Street, New York. Handsomely printed and illustrated catalog of 40 pages, dealing with Diesel engines of the vertical type. A comparison of Diesel engines with steam driven and gasoline units is included and also full details of the principles of operation, fuel guarantee and consumption, lubrication, speed regulation and general specifications. The engines range in size from 130 to 1500 hp.

Speed Reducers.—W. A. Jones Foundry & Machine Co., 4401 West Roosevelt Road, Chicago. Catalog 26, containing full information about spur gear speed reducers offered by the company.

Condulets.—Crouse-Hinds Co., Syracuse, N. Y. Folder 50, providing a brief description of the new Obround conduit, Form 7, manufactured for all sorts of engineering purposes.

Hand Operated Cranes.—Box Crane & Hoist Corporation, Philadelphia. Bulletin 3400, dealing with hand operated traveling cranes. The units listed have maximum lifts of as high as 25 tons and spans up to 60 ft. Full details and specifications are included.

Handling Equipment.—Link-Belt Co., Chicago. Book 575, 96 pages, illustrating and describing various types of elevators and conveyors manufactured by the company. Included are silent chain drives for many purposes, equipment for canning factories, saw mills and pulp plants, stone and lime handling equipment, cranes, railroad car dumpers, skip hoists, belt conveyors, etc.

Steel Platforms.—Youngstown Pressed Steel Co., Warren, Ohio. Three bulletins dealing with corrugated pressed steel platforms for hand and power elevating trucks. There are many illustrations and tables showing the sizes and capacities of the platforms.

Steel Bins and Hoppers.—Butler Bin Co., Waukesha, Wis. Loose-leaf catalog containing descriptions and illustrations of material handling bins, hoppers and bin gates. Various diagrams and dimensions are given and information on setting up and operation.

Precision Tools.—Nielsen, Inc., Lawton, Mich. Catalog descriptive of various precision tools of the Nielsen line. Included are ball bearing lathe centers, special centers, tapers, drill chucks and arbors and adapters for all makes of electric drills.

Electrical Instruments.—Roller-Smith Co., 233 Broadway, New York. Supplement No. 1 to bulletin 550, covering a new type of relays designed particularly for application with contact making instruments wherein a small current is desired to operate devices requiring relatively large current. Supplement No. 1 to bulletin 100 covering several types of instruments used principally in signal systems and automatic train control work.

Resilient Couplings.—Brown Engineering Co., Reading, Pa. Bulletin 28 dealing with Kanti-lever resilient couplings, and shear pins for resilient drive and flexible alignment. The bulletin is illustrated with installations and various tables.

Anti-Carbonizing Paints.—Case Hardening Service Co., 2281 Scranton Road, Cleveland. Booklet dealing with the uses and application of Non-Case anti-carbonizing paint. It comes prepared ready for use, and is said to be freely removable from threads and recesses without sticking.

Welding and Cutting Equipment.—Smith Welding Equipment Corporation, 2619 Fourth Street S. E., Minneapolis. Pocket-size catalog, listing and briefly describing the various items of welding and cutting equipment manufactured by the company.

Concrete Breakers.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Bulletin 81-I, describing the 75-lb. and 48-lb. "busters" designed for breaking concrete and asphalt pavements, demolishing foundations, excavating hard pan or frozen ground, driving sheet piling and shallow rock drilling.

Steam Specialties.—W. H. Nicholson & Co., 12 Oregon Street, Wilkes-Barre, Pa. Bulletin 227, dealing with devices for removing moisture, oil and dirt in compressed

air. Included are moisture separators, weight operated and piston operated water traps, tank traps and control valves.

Melting Furnaces.—American Gas Furnace Co., Elizabeth, N. J. Bulletin 5, describing with illustrations some of the various types of gas melting furnaces manufactured by the company. Melters dealt with are designed to use air at a pressure of approximately 1 lb. per sq. in. to induce the gas. Regulation, brass, ash fusion test melters and special types are included.

Handling Equipment.—Milwaukee Electric Crane & Mfg. Corporation, Milwaukee. "The Economical Handling of Lumber," an adequately printed and illustrated booklet devoted to various sorts of handling problems. Of particular interest are the sections devoted to positive oil lubrication, monorail hoists and switches, transfer bridges and cars and gantry cranes.

Pumps and Compressors.—Pennsylvania Pump & Compressor Co., Easton, Pa. Bulletin 132, describing the company's single stage air compressors and vacuum pumps with particular attention to the class 3-AE direct synchronous motor connected air compressor.

Diesel Engines.—Chicago Pneumatic Tool Co., New York. Bulletin 774, providing detailed description of the company's M. W. M. Benz Diesel engines, type RH 40. General description and details of construction are included with adequate photographs and charts.

Steel Grating.—Hendrick Mfg. Co., 60 Dundaff Street, Carbondale, Pa. Bulletin describing Mitco interlocked steel grating for subway ventilation and numerous industrial flooring and stairway needs. The flooring is made of high tensile square edge steel bars locked into position without the use of rivets, bolts or welding.

Electric Portable Hoists.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Bulletin 76-G, describing Sullivan single and double drum, electric portable hoists with numerous application pictures, graphically showing their power and adaptability. The machines are equipped with a 6½ hp. motor.

Electric Meters.—Brown Instrument Co., Philadelphia. A 40-page catalog, No. 33, fully illustrated, describes the various CO₂ meters and their applications, which this company produces. It also contains a short introduction covering the relation of furnace operating economy to CO₂ in flue gases.

Induction Motor Panels.—General Electric Co., Schenectady. Bulletin 763 of 16 pages illustrates and describes isolated type of induction motor panels for motors with wound or squirrel cage rotors. Tables of capacities and catalog numbers with list prices cover much of the bulletin.

Ball Bearings.—Standard Steel & Bearings, Inc., Plainville, Conn. Data sheets for use by designing engineers.

Gears.—Charles Bond Co., 617 Arch Street, Philadelphia. Catalog No. 52 of 146 pages, 3¼ x 5½ in., giving list prices and dimensions on a large variety of standard stock gears. Other transmission equipment includes chains and sprockets, worm drives, pulleys, hangers, ball and roller bearings and flexible couplings. Truck casters and wheels are also listed, and several pages are devoted to useful information. The book is indexed for convenient reference.

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